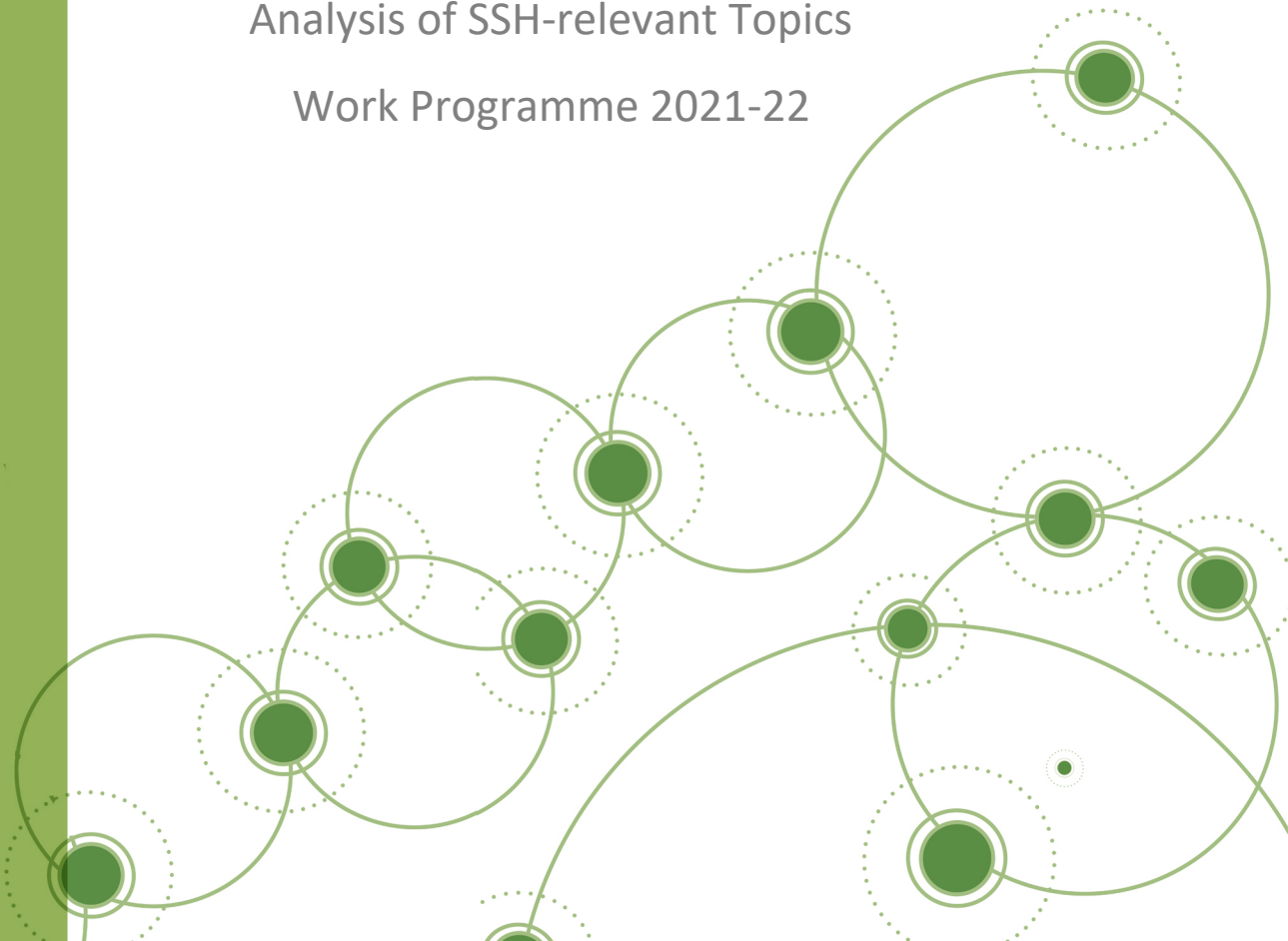BRIDGE2HE
with NCPs

Opportunities for Researchers from the Social Sciences and Humanities (SSH) in Horizon Europe

Analysis of SSH-relevant Topics

Work Programme 2021-22

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Call - Innovative governance, environmental observations and digital solutions in support of the Green Deal

Introduction

This document is designed to help potential proposers find SSH-related topics across the different parts of Horizon Europe 2021-2022 Work Programme.

SSH in Horizon Europe

Under Horizon Europe, the effective integration of SSH in all clusters, including all Missions and European partnerships, is a principle throughout the programme. The aim of SSH integration is to improve the assessment of and response to complex societal issues. Thus, SSH are a key constituent of research and innovation, especially regarding the twin green and digital transitions.

Therefore, where relevant, the R&I chain should include contributions from SSH disciplines such as sociology, economics, psychology, political science, history, cultural sciences or/and the arts.

SSH flagged topics

Many topics invite contributions from the SSH, often in collaboration with non-SSH disciplines such as natural and physical sciences, health sciences or technology. These topics have been 'flagged' and can be found on the Funding & Tenders Portal. Proposals under these topics are expected to integrate the SSH perspective (social, economic, behavioural, institutional, historical and/or cultural dimensions etc), as appropriate. Applicants should therefore ensure that:

• contributions from SSH disciplines are integrated throughout their proposed project, and

• the actions required, participants and disciplines involved as well as the added value of SSH contributions are clearly stated in the proposal.

The SSH methodologies used in the projects should be described, or if the applicant consortium considers that SSH is not relevant to their particular proposal, they should explain why.

Where relevant, applicants are also encouraged to include contributions from the SSH in a project proposal under any call, even if it is not SSH-flagged.

Content and structure of the document

This document compiles the "SSH-flagged topics" and is based on an analysis of SSH-relevant topics carried out in the unit of the EC Directorate-General for Research and Innovation that is responsible for Social Sciences and Humanities. The document also includes a few additional topics that, while not flagged, in the authors' view, require the contribution of Social Sciences and Humanities researchers.

This document serves as a guideline and is meant to demonstrate the wealth of possibilities for scientists in Social Sciences and Humanities within Horizon Europe and includes:
- SSH-DEDICATED TOPICS: topics where SSH aspects dominate the text,
- SSH-RELEVANT TOPICS: topics with substantial relevance to the SSH community. In this topics, SSH aspects are indicated in **bold text,**
- TOPICS WITH MINOR SSH RELEVANCE: short information is provided (title and link to the Participant Portal)

Researchers are strongly encouraged to screen the Work Programmes themselves, in order not to lose out on research opportunities offered to their specific interest. In any case, the Work Programmes need to be read in more detail to be aware about the overall approach of the Theme, the context of the topics, rules for participation and other specific requirements. At the same time, the topic texts may include footnotes with more information, which could not be included in the compiled topic texts within this document.
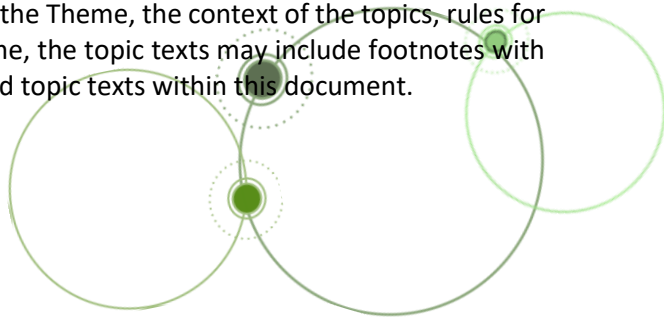
The structure of the document is determined by the degree of SSH integration in the different Horizon Europe programme parts. Instead of following the numerical order of the different parts in Horizon Europe this report starts with *Pillar II – Global challenges and European Industrial Competitiveness* that includes "top down" topics and the highest amount of SSH research dimensions, the *Clusters*. It continues with the SSH aspects in *Pillar II - Excellent science* (mostly "bottom up" opportunities). In the following chapter, the Opportunities in the *Widening Participation and Strengthening the European Research Area* are presented. Last but not least, the SSH-relevant topics in open calls of the *Missions* are included.

This document includes information on open or forthcoming topics for 2021-22 as of October 2021.

Cluster 1
Health

Call – Staying healthy

HORIZON-HLTH-2022-STAYHLTH-01-01-two-stage: Boosting mental health in Europe in times of change

Expected outcome

This topic aims at supporting activities that are enabling or contributing to one or several impacts of destination 1 "Staying healthy in a rapidly changing society". To that end, proposals under this topic should aim for delivering results that are directed, tailored towards and contributing to all of the following expected outcomes:

- Health care professionals, national/regional public authorities and other relevant actors in key settings (e.g. schools, workplaces, etc.):
  - Have access to and apply evidence-based, innovative, cost-effective/cost-neutral, large-scale, comprehensive strategies and interventions for the promotion of mental health and the prevention of mental ill health, targeting the most vulnerable populations;
  - Adopt clinical guidelines, best practices, implementation strategies and policy recommendations (as applicable to them) to mitigate the mental health burden and help cope with the (combined) effects of a transforming Europe (e.g. the socio-economic consequences of the COVID-19 pandemic, climate change, environmental degradation, energy transition, demographic and migration factors, digitalisation, and exponential technological advancements);
- The scientific community together with the public authorities anticipate new and emerging risks to mental health associated with a transforming Europe, contributing to better and inclusive public mental health preparedness.
- Citizens have access to and make use of new tools and services to take informed decisions about their wellbeing and mental health care needs (including for self-management and self-care).
- Citizens feel less stigmatised and marginalised due to their mental ill health

Scope

Against the backdrop of a transforming Europe and in the midst of a global pandemic, the EU is committed to lead the transition to a healthier planet and a new digital world. The health and wellbeing of its citizens is a prerequisite to achieve this aspiration.

On the one hand, extreme weather and environmental disasters have risen dramatically over the last decade. Links between these events and serious mental health problems, including anxiety, depression, post-traumatic disorder and suicide, have been reported. Moreover, several new words such as "eco-anxiety", "ecoparalysis" and "ecological grief" have been coined to express the acute and/or chronic effects on mental health caused by climate and environmental changes. On the other hand, digital technologies and the achievement of the Digital Single Market – one of the EU's key priorities – are transforming our economy, our industries as well as our culture and lifestyle. Digitalisation, including digitally-enabled technologies such as robotics and artificial intelligence, are penetrating much faster into societies than in the past and affect us all. Accordingly, the "Fourth Industrial Revolution"' is changing the way we work (e.g. workplaces, working practices and patterns, the workforce and its skills, and how we perceive work) as well as the way we live. The exponential incorporation of digital technologies in our daily lives has already caused profound changes in the way we communicate and is likely to have significant impact (both positive and negative) on mental health and intellectual/cognitive ability, in particular of the youth. Digital platforms can provide mental health support as well as increase social inclusiveness. However, digital technologies also introduce new risks, such as continuous connectivity, cyberbullying and exposure to inappropriate or fake content. Accordingly, **the proposed research should aim to deliver in all three dimensions listed below, focusing on one or several of the (combined) effects of a transforming Europe** highlighted in the "Expected Outcomes" .

1. Provide a comprehensive knowledge base of how a transforming Europe can influence mental health in a fast-evolving society, especially in the most vulnerable populations, by consolidating data from relevant sources and/or acquiring new data, and by reviewing existing methodologies.
2. Develop and implement (pilot and/or scale-up) interventions, which promote wellbeing and prevent mental illness to help cope with and mitigate the stress of a changing society, including digitalisation, climate change and/or other factors highlighted in the "Expected Outcomes". The interventions should target relevant settings (e.g. workplaces, schools) and the most vulnerable populations (e.g. children and adolescents, the elderly, people with pre-existing health conditions and co-morbidities and other high-risk groups such as socio-economic disadvantaged groups, migrants, etc.). Integration of care and coordination among different settings from communities to health care is desirable. The effectiveness of the interventions should be evaluated, inter alia, in terms of health outcomes, (comparative) cost-effectiveness, implementation facilitators and barriers. **Depending on the aspects covered by the proposed research, desired outputs may include, but are not limited to**:
   - Evidence-based guidelines for health care professionals on the promotion of mental wellbeing and prevention of mental illness related to ICT and climate and environment change (including screening methods).
   - **Evidenced-based pedagogical practices for education professionals to foster mental health promotion in schools (including higher education) and/or via eLearning**.
   - **Consultation during school time to educate students (e.g. on coping with change) and to detect early students at risk.**
   - **Educational material and campaigns targeting the most vulnerable groups, (e.g. children and the elderly), disseminated via the most appropriate and effective media and communication channels, to improve health literacy, skills, attitudes and self-awareness leading to a better (self-)management of wellbeing and/or mental ill health**.
   - **Studies on occupational mental health in the workplace**, in particular in small and medium-sized enterprises, e.g.: i) understanding the impact of a 24-hour digital economy on workers' well-being, also in terms of managerial control

mechanisms, work-life balance and privacy and developing/piloting new methods to protect and support workers' well-being in this respect; ii) designing information and training campaigns for workers to integrate the already visible impacts of digitalisation-induced changes into the professional risk assessment processes; iii) developing return-to-work programmes, also exploring innovative collaboration between mental health services, (life-long) education, and employment sectors. This will ensure appropriate support to better integrate individuals affected by mental ill health in the workforce and the society.

3. **Inform policy-makers and regulators on: i) the prevalence and burden of mental ill health related to a transforming European society (e.g. digital technologies, climate change, etc); and/or ii) the effects of a transforming European society (e.g. digitalisation, climate change and transition to "green jobs") on occupational mental health; and/or iii) the (comparative) cost-effectiveness of public mental health interventions/policy choices.**

Research should be multidisciplinary, including medical sciences, social sciences, the humanities, and the arts, if relevant. It is important to consider aspects such as (associated) behavioural patterns, stigma and novel social dynamics as well as different socioeconomic, cultural and geographical contexts. In all instances, sex and gender-related issues must be taken into account. All data should be disaggregated by sex, age and other relevant variables, such as by measures of socioeconomic status (i.e. take into account the socioeconomic gradient in mental health). International collaboration is encouraged. Proposals should involve end-users (including civil society organisations) and/or strategic partners in the design and during the course of the project. Possible end-users and strategic partners could include local or regional authorities, community services, employers, schools/universities, cultural institutions, insurance companies, civil society organisations, communities, among others. Proposals should adopt a patient-centred approach that empowers patients, promotes a culture of dialogue and openness between health professionals, patients and their families, and unleashes the potential of social innovation. All projects funded under this topic are strongly encouraged to participate in networking and joint activities, as appropriate. These networking and joint activities could, for example, involve the participation in joint workshops, the exchange of knowledge, the development and adoption of best practices, or joint communication activities. This could also involve networking and joint activities with projects funded under other clusters and pillars of Horizon Europe, or other EU programmes, as appropriate. Therefore, proposals are expected to include a budget for the attendance to regular joint meetings and may consider to cover the costs of any other potential joint activities without the prerequisite to detail concrete joint activities at this stage. The details of these joint activities will be defined during the grant agreement preparation phase. In this regard, the Commission may take on the role of facilitator for networking and exchanges, including with relevant stakeholders, if appropriate.

Type of action	Research and Innovation Action
Deadline	1st stage - **01 February 2022** 2nd stage - **06 September 2022**
Expected EU contribution per project	EUR 7.00 million
Topic information	Link

Call – Staying healthy

HORIZON-HLTH-2022-STAYHLTH-01-04-two-stage: Trustworthy artificial intelligence (AI) tools to predict the risk of chronic non-communicable diseases and/or their progression

<u>Expected outcome</u>

This topic aims at supporting activities that are enabling or contributing to one or several expected impacts of destination 1 *"Staying healthy in a rapidly changing society"*. To that end, proposals under this topic should aim for delivering results that are directed, tailored towards and contributing to all of the following expected outcomes.

- Clinicians, medical professionals and citizens have access to and use validated AI tools for disease risk assessment. Hence, citizens are better informed for managing their own health.
- Health care professionals utilise robust, trustworthy and privacy-preserving AI tools that help them to assess and predict the risk for and/or progression of chronic non-communicable diseases. Hence, citizens benefit from improved health outcomes.
- Health care professionals develop evidence-based recommendations and guidelines for the implementation of AI-based personalised prevention strategies. Hence, citizens benefit from optimized health care measures superior to the standard-of-care.
- Health care professionals employ quantitative indicators in order to identify and follow-up on individuals with high risk for the development and/or risk for the progression of chronic non-communicable diseases.

<u>Scope</u>

It is widely recognised that health systems must put more emphasis on prevention and adopt a person-centred approach. Artificial intelligence (AI) along with the increased availability of health data hold great potential to pave the way for personalised prevention and enable progress towards risk prediction and early detection of chronic non-communicable diseases.

This topic will support multidisciplinary research, build on broad stakeholder engagement and support proposals developing novel robust and trustworthy AI tools to enable timely personalised prevention approaches for chronic non-communicable diseases/disorders. The topic does not exclude any diseases/disorders.

Proposals are expected to develop and test AI tools for assessing and predicting the risk of developing a disease and/or the risk of disease progression once it is diagnosed, taking into account the individuals' (or groups) genotypes, phenotypes, life-style, occupational/environmental stressors and/or socio-economic and behavioural characteristics, as necessary. Sex and gender aspects should be considered, wherever relevant. The AI tools may include a broad range of technological solutions on their own and/or in combination with other relevant state-of-the-art technologies (i.e. AI algorithms, mobile apps and sensors, robotics, e-health tools, telemedicine etc.) Proposals should implement proof-of-concept studies to test and validate the performance of their AI tools in the real-world setting and compare their performance to the established practice. The applicants should ensure that the AI tools developed are driven by relevant endusers/citizens/health care professionals needs. Therefore, the proposals are expected to introduce concrete measures for the involvement of the end-users throughout the AI development process and not only in the last phases of development. SME(s) participation is encouraged with the aim to strengthen the scientific and technological basis of SME(s) and valorise their innovations for the people's benefit.

Proposals should address all of the following:

- Leverage existing high-quality health-relevant data from multiple sources (i.e. cohorts, electronic health records and registries, taking into account the individual's genotypic/phenotypic, medical, life-style, **socio-economic, behavioural data** etc.) and/or generation of new high-quality health data necessary for the rigorous development of the AI disease-risk tools.
- Develop the adequate performance metrics to assess the technical robustness of the developed AI tools for risk assessment of disease and/or disease progression and in particular their accuracy, reliability, reproducibility and generalisability. Proposals should assess the possible inherent bias introduced to the AI tools originating from the data quality used for their development.
- Develop the criteria to assess the effectiveness of the AI tools for disease risk assessment in terms of improving health outcomes and enabling personalised prevention strategies.
- Implement proof of concept and/or feasibility studies to validate the AI tools for risk assessment of disease and/or disease progression in a relevant end-users environment and/or real-world setting and assess their performance in comparison to the standard-of care.

Proposals should adhere to the FAIR data principles and apply good practices for GDPR compliant personal data protection. Proposals are encouraged to implement international standards and best practices used in the development of AI solutions.

Integration of ethics and health humanities perspectives to ensure an ethical approach to the development of AI solutions. In relation to the use and interpretation of data, special attention should be paid to systematically assess for gender and ethnic bias and/or discrimination when developing and using data-driven AI tools.

To ensure citizens' trust, wide uptake by user communities and scalability of the solutions across clinical contexts, actions should promote the highest standards of transparency and openness of the AI tool, going well beyond documentation and extending to aspects such as assumptions, architecture, code and underlying data.

Applicants are highly encouraged to deliver a plan for the regulatory acceptability of their technologies and to interact at an early stage with the regulatory bodies, whenever relevant.

All projects funded under this topic are strongly encouraged to participate in networking and joint activities, as appropriate. These networking and joint activities could, for example, involve the participation in joint workshops, the exchange of knowledge, the development and adoption of best practices, or joint communication activities. This could also involve networking and joint activities with projects funded under other clusters and pillars of Horizon Europe, or other EU programmes, as appropriate. Therefore, proposals are expected to include a budget for the attendance to regular joint meetings and may consider to cover the costs of any other potential joint activities without the prerequisite to detail concrete joint activities at this stage. The details of these joint activities will be defined during the grant agreement preparation phase. In this regard, the Commission may take on the role of facilitator for networking and exchanges, including with relevant stakeholders, if appropriate.

Type of action	Research and Innovation Action
Deadline	1st stage - **01 February 2022** 2nd stage - **06 September 2022**
Expected EU contribution per project	EUR 6.00 million
Topic information	Link

HORIZON-HLTH-2022-STAYHLTH-01-05-two-stage: Prevention of obesity throughout the life course

Expected outcome

This topic aims at supporting activities that are enabling or contributing to one or several impacts of destination 1 "Staying healthy in a rapidly changing society". To that end, proposals under this topic should aim for delivering results that are directed, tailored towards and contributing to some of the following expected outcomes:

- Researchers, developers of medical interventions, and health care professionals have a much better understanding of basic biological pathways (genetic and epigenetic blueprints) conferring susceptibility to and protecting against overweight/obesity, i.e. how genetic, epigenetic, environmental, **socio-economic and lifestyle factors interact to drive or prevent the transition from normal weight to overweight/obesity throughout the life course.**
- Health care professionals, national/regional/local public authorities and other relevant actors (e.g. schools, canteens, hospitals, work places, shopping malls, sport centres):
  - Have access to, adopt and implement evidence-based clinical guidelines, best practices, coordinated, pan-European, **multidisciplinary preventive strategies, policy recommendations and/or new policies to fight overweight/obesity and their co-morbidities throughout the life course.**
  - **Have access to and make use of a robust outcomes framework and tool-kit for standardised collection of economic and cost data related to the prevention and treatment of overweight/obesity and its co-morbidities at population level across European regions and countries**.
  - Adopt and implement tailor-made prevention campaigns to tackle overweight/obesity, including campaigns for improving integration of health education into academic learning and raising awareness of health care providers and citizens.
- Citizens have access to and make use of new tools and services to make informed decisions about lifestyle choices that will prevent them from becoming overweight/obese

Scope

Obesity is one of the most serious public health challenges of the 21st century. Although health has improved in the EU over the last decades, the prevalence of obesity has tripled in many countries of the EU. It is known that once individuals become overweight or obese, they are at risk of developing related diseases (diabetes, cardiovascular diseases, cancer). Overweight and obesity are largely preventable. In the current pandemic, the issue of overweight/obesity has become even more prominent, highlighting the need for prevention of overweight/obesity.

Increased efforts in research and innovation are critical for developing and testing the impact of tools, initiatives, interventions, strategies, programmes, policies and their implementation to prevent overweight/obesity. The use of best practices, harmonisation guidelines and/or standard operating procedures, developed at various levels (from local to national) in the EU and beyond, will be the foundation for new research.

Cultural diversity, urban/rural dichotomy, socio-economic status, age groups, sex and gender differences should be investigated, where relevant. Strong collaborations across sectors and with other European projects dealing with issues such as agriculture, aquaculture, food, environment, etc. are welcome. Proposals should engage citizens, civil society organisations (e.g. employers/employee organisations, charities), authorities (e.g. municipalities and health authorities) and institutions (schools, canteens, hospitals, work places, shopping malls, sport centres), local producers, etc. in the development of their actions to ensure

acceptability and deployment. Proposals should aim to develop scientifically robust and transparent methodologies, building on achievements from previous research activities.

Proposals should address several of the following research bottlenecks:
- A comprehensive understanding of biological pathways (genetic, epigenetic, molecular, microbiome, and/or neuroimmune) conferring susceptibility to and protecting against uncontrolled "weight gain".
- **Identification of socio-economic and lifestyle factors influencing consumer behaviour and their association to overweight/obesity prevention.**
- Identification of pre-obesity biomarkers (genetic, laboratory, imaging, etc.) and their association to lifestyle and environmental interventions aiming at obesity prevention and tailored to specific target populations.
- Mapping existing implementation research activities to prevent overweight/obesity, outcome analyses and identification of best practices.
- Conducting a thorough meta-review of information from available scientific literature and identification of the relationship between the risk for overweight/obesity and the biology of obesity, lifestyle habits, exposures, susceptibility to co-morbidities and/or all of their combinations.
- Developing recommendations and guidelines for what constitutes an appropriate healthy diet for different age and health groups.
- Understanding the causal links between overweight/obesity and sedentary behaviour, quality and quantity and types of food/drinks, physical activity, and personality traits.
- Designing a creative and engaging programme to reach the optimal balance between diets and physical activity for the prevention of overweight/obesity.
- **Analysing obesity stigma, stress and work-life balance, circadian rhythm disruption, mental health (including psychological problems), screen-time dependency, drugs and side effect of drugs, for the prevention of overweight/obesity.**
- **Addressing inequality aspects of overweight/obesity at multiple levels, taking into account vulnerable groups, gender and socio-economic factors.**
- Setting up pilots to assess the effectiveness of obesity management strategies, including cost-effectiveness, and analyse the impact of inactions, taking into account comorbidities and value-based care system.
- Developing a system for monitoring population indicators relevant to overweight/obesity by extending European Core Health Indicators.

Proposals should adopt a patient-centred approach that empowers patients, promotes a culture of dialogue and openness between health professionals, patients and their families, and unleashes the potential of social innovation.

Proposals could consider the involvement of the European Commission's Joint Research Centre (JRC) whose contribution could consist of providing added-value regarding aspects of healthier school environments, effectiveness of policies influencing food preferences as well as improving the food offer and food environment.

All projects funded under this topic are strongly encouraged to participate in networking and joint activities, as appropriate. These networking and joint activities could, for example, involve the participation in joint workshops, the exchange of knowledge, the development and adoption of best practices, or joint communication activities. This could also involve networking and joint activities with projects funded under other clusters and pillars of Horizon Europe, or other EU programmes, as appropriate. Therefore, proposals are expected to include a budget for the attendance to regular joint meetings and may consider to cover the costs of any other potential joint activities without the prerequisite to detail concrete joint activities at this stage. The details of these joint activities will be defined during the grant agreement preparation phase. In this regard, the Commission may take on the role of facilitator for networking and exchanges, including with relevant stakeholders, if appropriate.

Type of action	Research and Innovation Action
Deadline	1st stage - **01 February 2022** 2nd stage - **06 September 2022**
Expected EU contribution per project	EUR 10.00 million
Topic information	Link

HORIZON-HLTH-2022-STAYHLTH-02-01: Personalised blueprint of chronic inflammation in health-to-disease transition

Expected outcome

This topic aims at supporting activities that are enabling or contributing to one or several expected impacts of destination 1 "Staying healthy in a rapidly changing society". To that end, proposals under this topic should aim for delivering results that are directed, tailored towards and contributing to several of the following expected outcomes:

- Researchers and medical professionals understand the chronic inflammation factors triggering the health-to-disease transition and subsequently provide optimal counselling to citizens for improving their health.
- Health care professionals have access to and employ objective health indicators of chronic inflammation for monitoring the health status, establishing personalised prevention measures and improving the health outcomes for citizens.
- Health care professionals have the scientific evidence and understanding of health-to-disease transition to develop and use improved guidelines for personalised prevention strategies to tackle chronic diseases.
- Citizens are better informed to actively manage their own health, have the tools to maintain their healthy status, improve their health and reduce their risk for developing chronic diseases.

Scope

Personalised approaches for disease prevention seek to determine the predisposition to disease and deliver timely and targeted prevention measures. Understanding the risk factors that trigger the health-to-disease transition is essential for delivering personalized prevention measures or reducing the burden of chronic diseases.

A large body of clinical evidence has accumulated over the past decade demonstrating that chronic inflammation is a process implicated in chronic diseases/disorders. Inflammatory response is a physiological process helping the body to heal against harmful entities, but when dysregulated it could lead to unresolved chronic local or systemic inflammation. The later in combination with the person's genotype, phenotype, medical history, nutritional and well-being status, life-style and/or occupational/environmental/life stressors is likely to be involved in driving the health-to-disease transition, leading to the onset of chronic diseases.

Proposals should be of multidisciplinary nature involving all relevant stakeholders and may cover several different stages in the continuum of the innovation path (from translational research to validation of the findings in human studies etc.), as relevant.

Proposals are expected to develop and implement data-driven, personalised approaches to identify the drivers of chronic inflammation that may determine the transition from health to pre-symptomatic and early stages of chronic diseases/disorders. The topic does not exclude any diseases/disorders. The human studies and human data utilised/generated should be compatible to an age range as representative as possible to the pre-disease phase and onset of the disease to be studied, in order to boost the fast translation of the research results into proof-of-concept studies.

Proposals should develop personalised diagnosis and/or prevention strategies linked to chronic systemic/local inflammation and assess the effects of different types of interventions and/or their combinations i.e. pharmacological, non-pharmacological, nutritional supplements, diet and life-style modifications, as relevant. Sex and gender differences should be investigated, wherever relevant.

The proposals should address several of the following areas:

- Integrate state-of-the-art knowledge and data from suitable human studies (i.e. medical/clinical, well-being, life-style etc.) to identify actionable factors linking chronic systemic and/or local inflammation to the health-to-disease transition. Take stock of omics (i.e. genomics, metabolomics, nutrigenomics, microbiomics etc.), of dynamic measurements of the health and well-being status, and of data-driven analytical tools in order to identify biomarkers and other health indicators linked to the health-to-disease transition.
- Understand at the systems-level the human biology and physiology underlying chronic inflammation in connection to the tissues/organ dysregulation, organ cross-talk and homeostasis breakdown triggering the health-to-disease transition, taking into account the person's genotype, phenotype, medical history, nutritional and well-being status, lifestyle and/or occupational/environmental/life stressors.
- Develop and deploy robust sensors, devices and/or mobile apps and other innovative technologies to monitor dynamically the individual's health status and to identify objective indicators of chronic inflammation correlative to the health-to-disease transition.
- Implement proof-of-concept human studies to assess the beneficial effect of diverse prevention and/or interventions strategies with the aim to demonstrate improved health outcomes.
- Test suitable interventions with the aim to demonstrate the reduction and/or reversion of the pre-disease state linked to chronic systemic and/or local inflammation.
- **Proposals should adopt a patient-centred approach to inform and empower patients, promote a culture of dialogue and openness between health professionals, patients and their families, and unleash the potential for social innovation.**

The proposals should adhere to the FAIR data principles and adopt wherever relevant, data standards and data sharing/access good practices developed by existing European health research infrastructures.

All projects funded under this topic are strongly encouraged to participate in networking and joint activities, as appropriate. These networking and joint activities could, for example, involve the participation in joint workshops, the exchange of knowledge, the development and adoption of best practices, or joint communication activities. This could also involve networking and joint activities

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with projects funded under other clusters and pillars of Horizon Europe, or other EU programmes, as appropriate. Therefore, proposals are expected to include a budget for the attendance to regular joint meetings and may consider to cover the costs of any other potential joint activities without the prerequisite to detail concrete joint activities at this stage. The details of these joint activities will be defined during the grant agreement preparation phase. In this regard, the Commission may take on the role of facilitator for networking and exchanges, including with relevant stakeholders, if appropriate.

Type of action	Research and Innovation Action
Deadline	**21 April 2022**
Expected EU contribution per project	EUR 7.00 million
Topic information	Link

HORIZON-HLTH-2022-ENVHLTH-04-01: Methods for assessing health-related costs of environmental stressors

<u>Expected outcome</u>

This topic aims at supporting activities that are enabling or contributing to one or several expected impacts of destination 2 'Living and working in a health-promoting environment'. To that end, proposals under this topic should aim for delivering results that are directed, tailored towards and contributing to all of the following expected outcomes:

- EU and national public authorities regularly use economic and health modelling in policy impact assessments and policy evaluation, and promote the use of these to other stakeholders;
- Stakeholders agree on the most relevant population health and quality of life metrics, including DALYs (Disability Adjusted Life Years) or QALYs (Quality Adjusted Life Years), and economic metrics;
- The stakeholder community follows common guidelines and methodologies for integrative socio-economic assessments and cost-benefit analysis of environmental pollution in Europe.

<u>Scope</u>

Policy-makers face challenges when devising pollution mitigation measures and having to assess the health costs emerging from life-long exposures to environmental stressors or the benefits from clean environments. Deaths and disabilities resulting from pollution carry a quantifiable economic cost to society, but there are significant uncertainties in the cost estimates methodologies. There is also paucity of data to evaluate the economic benefits of clean environments.

Impact Pathway Analysis and Health Impact Assessment (HIA) are methodologies, which can be useful in linking scientific knowledge with environmental economics for informing policy action in diverse sectors such as transport, energy, chemicals, occupational health etc.

Proposed research activities should mainly aim to improve the calculation of the socio-economic costs (and/or benefits) of health impacts during the life-course associated to environmental stressors, or combinations of these, advance methodological approaches and foster their acceptance as common good practice. **Proposals should consider all of the following activities:**

- Systematic review and exploitation of latest evidence of exposure-response functions and causation resulting from published medical and scientific research accumulated data from the past 10-20 years, including results published based on EU-funded research projects;
- Identification of data gaps as regards environment and health risk factors and health-related tangible and intangible costs and recommendations on priorities for new data collections;
- Advancement of methodological rigor and consistency in accounting for morbidity and mortality, disabilities, linking valuation of statistical life and/or life-years with quality adjustments within a unified framework, based on the most recent data available and adapted to the needs and circumstances in Europe;
- **Application of experimental approaches addressing the potential link of quality of life and the burden of disease indicators with more integrative impact indicators (e.g. reflecting subjective well-being, health, work-life balance, education, housing, etc.)** and identification of how national contexts can impact on health-related costs of the same environmental and occupational exposure;
- **Enhancement of the understanding of the role of discounting and other methods for weighing present and future costs and benefits;**
- Development of innovative tools, methods and models, and associated guidelines for health impact assessments and related cost-benefit analysis;
- Consultation of experts and stakeholders on tools, models, methods and assessments developed towards a shared agreement of these;
- Development of case studies involving public authorities comparing the costs of action and non-action in at least three EU or associated countries;
- Delivery of FAIR data and a user-friendly access to an open knowledge base including results, methodologies and data appropriate for use in public policies and budget allocations.

Projects could consider the involvement of the European Commission's Joint Research Centre (JRC) in the field of health impacts of environmental stressors.

All projects funded under this topic are strongly encouraged to participate in networking and joint activities, as appropriate. These networking and joint activities could, for example, involve the participation in joint workshops, the exchange of knowledge, the development and adoption of best practices, or joint communication activities. This could also involve networking and joint activities with projects funded under other clusters and pillars of Horizon Europe, or other EU programmes, as appropriate. Therefore, proposals are expected to include a budget for the attendance to regular joint meetings and may consider to cover the costs of any other potential joint activities without the prerequisite to detail concrete joint activities at this stage. The details of these joint activities will be defined during the grant agreement preparation phase. In this regard, the Commission may take on the role of facilitator for networking and exchanges, including with relevant stakeholders, if appropriate.

Whenever appropriate, the use of environmental data and products coming from the Copernicus programme, specifically the Copernicus Atmosphere Monitoring Service (CAMS) and the Copernicus Climate Change Service (C3S), is encouraged.
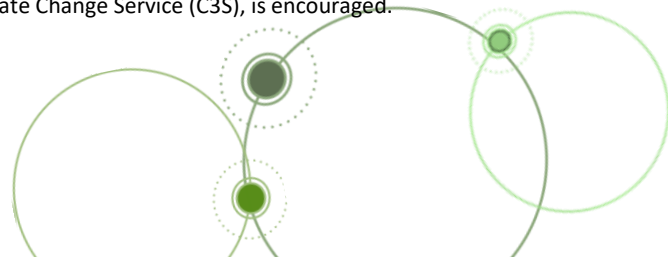
Call – Tackling diseases

Type of action	Research and Innovation Action
Deadline	**21 April 2022**
Expected EU contribution per project	EUR 4.00 million
Topic information	Link

HORIZON-HLTH-2022-DISEASE-07-03: Non-communicable diseases risk reduction in adolescence and youth (Global Alliance for Chronic Diseases - GACD)

Expected outcome

This topic aims at supporting activities that are enabling or contributing to one or several expected impacts of destination 3 "Tackling diseases and reducing disease burden". To that end, proposals under this topic should aim for delivering results that are directed, tailored towards and contributing to some of the following expected outcomes:

- Health care practitioners and providers in low- and middle-income countries (LMICs) and those in high-income countries (HICs) serving vulnerable populations have access to and use specific guidelines to implement prevention interventions able to support adolescents and young people to decrease future risks of developing NCDs.
- **Public health managers and authorities have access to improved insights and evidences on the NCDs related to behaviours and conditions in youth and adolescence. They establish improved health policies to diminish these risks, including to facilitate the deployment of effective public health interventions.**
- **Researchers, clinicians and authorities have an improved understanding of the factors that influence the implementation of preventive actions that address risk behaviours in youth and adolescence.**
- Communities and local stakeholders and authorities are fully engaged in implementing and taking up health interventions and thus contribute to deliver better health.

Scope

The European Commission is a member of the Global Alliance for Chronic Diseases (GACD), an alliance of international funding agencies representing over 80% of the world's public health research funding and the first collaboration of its kind to specifically address non-communicable diseases (NCDs). The GACD supports implementation science to improve health outcomes.

This topic is launched in concertation with the other GACD members funding agencies and aligned with the GACD call 2021. The topic is focused on implementation research about common risk prevention interventions targeting adolescents and youth to reduce the impact of non-communicable diseases (NCDs) in low- and middle-income countries (LMICs) and vulnerable populations in high-income countries (HICs). Proposals should focus on implementation science around evidence-based interventions that promote healthy behaviours, and that have the potential to profoundly reduce the risk of chronic diseases and multimorbidity.

The GACD Alliance is particularly interested in funding projects that focus on interventions that reduce health risk and/or enhance a healthy lifestyle in young people, which the WHO defines as the period from ages 10-24 and includes adolescence (ages 10-19) and youth (15- 24). Adolescence and youth mark a period of emerging independence and an important time for laying the foundations of good health. Adolescence and youth is a period in life where patterns of behaviour are established around diet, physical activity, substance use and sexual activity, which can affect their health in the present; in their future adult lives; and even in the next generation. In the transition from childhood to adulthood, young people become increasingly exposed to harmful products such as tobacco, alcohol and drugs, and can experience devastating mental health issues such as depression, anxiety, self-harm, substance abuse and addictions, as well as eating disorders and suicide. Over 150 million young people smoke; 81% adolescents do not meet physical activity guidelines; 11.7% of adolescents partake in heavy episodic drinking; and suicide has emerged as a leading cause of death in young people globally.

All proposals must make the case for why their selected life stage is a critical period for the reduction of NCD risk in the communities where the research will be undertaken. There are a range of evidence-based interventions, including the WHO Best Buys, which aim to reduce the health risks associated with common NCD risk factors. Implementation research is necessary to understand the uptake, accessibility, acceptability, adaption, sustainability and costs of known interventions for use in young adults and adolescents. Applicants are invited to consider interventions at the individual, family, community (e.g., work or school) or population level. **Multi-sectoral approaches and a combination of different types of interventions, including** biomedical, digital (such as artificial intelligence and big data), **socio-behavioural**, and/or structural are encouraged. Projects will be expected to build on evidence-based interventions that focus on prevention interventions and strategies that reduce common risk factors for chronic non-communicable diseases, or that promote healthy behaviours. Such interventions/strategies might include, but are not limited to, those in the following three areas: nutrition, physical activity, and/or sleep; tobacco, substance abuse and/or alcohol use; social wellbeing and loneliness. **Proposals should be gender-responsive and consider socioeconomic, racial or other factors that relate to equitable impacts of the intervention or barriers to equitable implementation.**

Proposals should include implementation research outcomes (e.g. feasibility, fidelity and/or adaptation, spread and/or penetration, acceptability, sustainability, uptake, and cost effectiveness) and where relevant, include service outcomes (e.g. efficiency, safety, effectiveness, patient-centeredness, timeliness). The aim is to harmonise the research common goals and the outcomes assessment of GACD-funded projects in order to maximise the potential for learning across the network and the impact of the initiative as a whole. To this end, all funded teams are expected to use explicit indicators and measures of project context, reach, outcomes evaluation and scale-up potential in their plans and protocols. In this topic, **the use of the following measures is encouraged: evidence of uptake of promoted healthy behaviours; evidence of reduction in harmful behaviours; and proxy mental and/or physical health outcomes**, if appropriate (pre- and post- intervention PHQ-9 scores, blood pressure, HbA1C, etc.).

Proposals should include a strategy to include policy makers and local authorities, as well as other relevant stakeholders such as community groups. Such engagement should inform the conception and development of the project and should continue throughout the duration of project and afterwards during the knowledge translation phase. Participants that are local stakeholders can be powerful assets to the projects indeed. Their contributions should be nurtured through meaningful engagement throughout all phases of the project, not only as participants in the research undertaken.

Call – **Tackling diseases**

Type of action	Research and Innovation Action
Deadline	**21 April 2022**
Expected EU contribution per project	EUR 3.00 million
Topic information	Link

Topics with minor SSH relevance

HORIZON-HLTH-2022-DISEASE-06-02-two-stage: Pre-clinical development of the next generation of immunotherapies for diseases or disorders with unmet medical needs

Link

HORIZON-HLTH-2022-DISEASE-06-03-two-stage: Vaccines 2.0 - developing the next generation of vaccines

Link

HORIZON-HLTH-2022-DISEASE-06-04-two-stage: Development of new effective therapies for rare diseases

Link

Call – Ensuring access to innovative, sustainable and high-quality health care

HORIZON-HLTH-2022-CARE-08-04: Better financing models for health systems

Expected outcome

This topic aims at supporting activities that are enabling or contributing to one or several expected impacts of destination 4 "Ensuring access to innovative, sustainable and high-quality health care". More specifically, this topic aims at supporting activities that are contributing to some of the following expected impacts:

- Health and social care services and systems have improved governance mechanisms and are more effective, efficient, accessible, resilient, trusted and sustainable, both fiscally and environmentally. Health promotion and disease prevention will be at their heart, by shifting from hospital-centred to community-based, people-centred and integrated health care structures and successfully embedding technological innovations that meet public health needs, while patient safety and quality of services is increased.
- Health policy and systems adopt a holistic approach (individuals, communities, organisations, society) for the evaluation of health outcomes and value of public health interventions, the organisation of health care, and decision-making.

To that end, proposals under this topic should aim for delivering results that are directed, tailored towards and contributing to some of the following expected outcomes:

- Decision and policymakers in the field of health care avail of new approaches to financial planning and financing mechanisms that provide flexibility to stretched health budgets, including alternative procurement and contractual methods;
- Decision and policymakers in the field of health care apply cost-effective spending strategies based on the optimisation of the use of resources, while maintaining or improving health outcomes in an equitable way;
- Decision and policymakers in the field of health care access tools that enable them to better remunerate, contract and incentivise health care professionals and providers;
- Decision and policymakers in the field of health care take evidence-based and socially equitable health care financial decisions.

Scope

In 2017, spending on health care in the EU stood at 9.6% of gross domestic product, ranging from over 11% in France and Germany to less than 6% in Romania. In most countries, in-patient care services made up the bulk of health spending, while spending on pharmaceuticals also accounted for a large share of health expenditure in some countries. Due to demographic changes in the EU with a population projected to continue ageing and higher expectations regarding provision of health care services, public health threats with relevant repercussions for society and the introduction of innovative and digital solutions to improve health care systems' functioning, the demand for health care services as well as the budgetary pressures on health care systems are and will keep increasing.

Future models of care delivery will have to take into account both the systemic and multi-dimensional performance perspective and to look at relevant outcome and quality indicators, structure of care delivery, and knowledge base regarding optimal care delivery systems.

Therefore, **research and innovation should tackle the challenges of financing health care services in the EU by addressing one or more of the following:**

- **Financing of health care – development of new cost-effective models for financing and reimbursement, including incentive mechanisms and outcome-based financing** in order to promote good performance of the health care systems.
- **Financing of preventive health care – novel models and appropriate structure of financial incentives for effective health promotion and disease prevention, financial incentives for stronger co-operation between primary care and public health services, long-term sustainable financing mechanism for local- and municipality-run promotion programmes and the assessment of personal health risk behaviour and its potential impact on health costs.**
- **Innovative purchasing and contract methods – new strategies for contracting provision of health care services** (public sector hired services) **as well as solutions to better assess provision capacity and quality, to assess markets, and cost-effectiveness as well as equal access of contracting-out services**. This can help align the incentives of providers with those of patients and the public good.
- **New and improved tools for better design of incentives for health care professionals** – incentives that minimise differentiation between services and "cream-skimming" by patients, fostering better health care planning, optimized use of health care services and avoidance of resources' overconsumption and -waste.

Value-based pricing- and payment models for health technologies are not in the scope of this topic; such models are covered by topic "New pricing and payment models for cost-effective and affordable health innovation" (HORIZON-HLTH-2022-IND-13-03) under destination 6.

Research and innovation in these areas should take into account the potential impact of public health emergencies and threats on the sustainability, financing, as well as the effective and efficient functioning of EU health care systems.

To ensure wide uptake by user communities and scalability of the models and methods across health systems, actions should promote the highest standards of transparency and openness, going well beyond documentation and extending to aspects such as assumptions, architecture, code and any underlying data.

Applicants are highly encouraged to actively involve public authorities (i.e. ministries of finances and health, procurement agencies/procurers and agencies responsible for the management of health services contracts, public health and health-policy institutes, health administrations, among other) in the proposals.

Call – Ensuring access to innovative, sustainable and high-quality health care

Projects funded under this topic are strongly encouraged to participate in networking and joint activities, as appropriate, and in particular they are expected to liaise with successful applicants under topic "New pricing and payment models for cost-effective and affordable health innovation" (HORIZON-HLTH-2022-IND-13-03) and the consortium to be created under the planned "European Partnership on Transforming Health and Care Systems" (HORIZON-HLTH-CARE-2022-IND-10-01). These networking and joint activities could, for example, involve the participation in joint workshops, the exchange of knowledge, the development and adoption of best practices, or joint communication activities. This could also involve networking and joint activities with projects funded under other clusters and pillars of Horizon Europe, or other EU programmes, as appropriate. Therefore, proposals are expected to include a budget for the attendance to regular joint meetings and may consider to cover the costs of any other potential joint activity without the prerequisite to detail concrete joint activities at this stage. The details of these joint activities will be defined during the grant agreement preparation phase. In this regard, the Commission may take the role of facilitator for networking and exchanges, including with relevant stakeholders, if appropriate.

Type of action	Research and Innovation Action
Deadline	**21 April 2022**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

Topics with minor SSH relevance

HORIZON-HLTH-2022-CARE-08-02: Pre-commercial research and innovation procurement (PCP) for building the resilience of health care systems in the context of recovery
Link

HORIZON-HLTH-2022-CARE-08-03: Public procurement of innovative solutions (PPI) for building the resilience of health care systems in the context of recovery
Link

Call – **Tools and technologies for a healthy society**

HORIZON- HORIZON-HLTH-2022-TOOL-11-01: Optimising effectiveness in patients of existing prescription drugs for major diseases (except cancer) with the use of biomarkers

Expected outcome

This topic aims at supporting activities that are enabling or contributing to one or several expected impacts of destination 5 "Unlocking the full potential of new tools, technologies and digital solutions for a healthy society". To that end, proposals under this topic should aim for delivering results that are directed, tailored and contributing to all of the following expected outcomes:

- Diagnostics industries move towards market approval for companion diagnostics.
- Regulatory authorities approve companion diagnostics and make recommendations for the prescription of existing drugs.
- Health care providers use biomarkers with existing pharmaceuticals to treat more efficiently and cost-effectively patients, with less adverse effects.

Scope

The applicants should perform the clinical validation of qualified biomarkers (not limited to molecular biomarkers) that will enable the identification of appropriate patients to ensure an effective and efficient use of existing pharmaceuticals in the treatment of major diseases and conditions. **The relevant biomarkers should allow providing the right medicinal product, at the right dose and the right time, according to the concept of personalised medicine, taking into account, among others, differences of sex, age, ethnicity and gender identity.** This topic refers to medicines that are already on the market and not to the validation of biomarkers for the development of new medicinal products. It addresses broadly prescribed medicines for major diseases and conditions, including but not limited to cardiovascular diseases. A condition is that preliminary studies or publications have demonstrated that the pharmaceuticals considered are efficient in less than 50% of the population treated. This topic excludes cancer and rare disease treatments. The applicants should consider existing guidelines, standards and regulations, as appropriate. Synergies with relevant European Research Infrastructures are encouraged.

Type of action	Research and Innovation Action
Deadline	**21 April 2022**
Expected EU contribution per project	EUR 10.00 million
Topic information	Link

Call – Tools and technologies for a healthy society

HORIZON-HLTH-2022-TOOL-11-02: New methods for the effective use of real-world data and/or synthetic data in regulatory decision-making and/or in health technology assessment

Expected outcome

This topic aims at supporting activities that are enabling or contributing to one or several expected impacts of destination 5 "Unlocking the full potential of new tools, technologies and digital solutions for a healthy society". To that end, proposals under this topic should aim for delivering results that are directed, tailored towards and contributing to all of the following expected outcomes:

- Health regulatory bodies and/or Health Technology Assessment (HTA) bodies adopt optimised data-driven methodologies for the effective use of real-world data (including omics data) , and/or synthetic data derived from digital twins and advanced computational methods (such as modelling and simulation or approaches based on machine learning/AI), for the assessment of medicinal products and/or digital health innovations.
- Health regulatory authorities and bodies (e.g. medicines agencies, HTA bodies, notified bodies for medical devices) use optimised guidelines for the development and assessment of medicinal products and/or medical devices including digital health innovations.
- Health regulatory authorities and bodies across Europe are trained in data-driven decision making using emerging data types.

Scope

With the emerging use of real-world data (RWD) and synthetic data by the pharmaceutical industry and medical devices industry, regulators and HTA bodies need to perform targeted validation of claims through independent analysis. The principal aim of this topic is to address the data needs of health regulatory bodies and HTA bodies across the EU, as outlined in the recently published "HMA-EMA Joint Big Data Taskforce Phase II report: 'Evolving Data-Driven Regulation'" and its associated DARWIN (Data Analysis and Real World Interrogation Network) project. To harness the potential of RWD and synthetic data from digital twins and advanced analytical models, and make them actionable for health regulatory decision-making and for health technology assessment, targeted research is needed on the evidentiary value of these data for a number of relevant use cases. In addition, methods need to be developed to increase the usability of such data by different stakeholder groups. Doing so will contribute to the European Health Data Space and maximise the positive impact of DARWIN in driving up the quality of evidence and decisions on the development and use of medicines and digital health innovations.

Access to and analysis of RWD and synthetic data can inform regulatory decision-making throughout the product lifecycle, namely: 1) support product development (e.g. scientific advice, PRIME), 2) support authorisation of new medicines and digital health innovations; and 3) monitor the performance of medicines and digital health innovations on the market (effectiveness and safety). Eventually, this will put in place methods and processes that will enable continuous learning from pre-authorisation procedures and authorisation applications on the use of RWD and/or synthetic data. Proposals should address all of the following areas:

- **Develop a set of evidentiary standards to be pre-specified and used in the analysis of real-word evidence and/or synthetic data applied to different types of regulatory advice and/or health technology assessment** and decisions on the safety and efficacy/effectiveness of medicines and digital health innovations (e.g. in complement to clinical trial data in an authorisation application, or for extension of indications, post marketing surveillance, amendment of product information or regulatory actions on the marketing authorisation due to safety concerns). **This includes validating the use of advanced analytical methods for regulatory decision-making and/or health technology assessment**.
- Address aspects that would enable moving towards a standard data quality framework reproducible across different types of RWD and/or synthetic data sources for regulatory decision-making and/or health technology assessment, with a characterisation of the data collection, management and reporting and an empirical data quality validation. In this regard, it will be important that successful proposals liaise with and closely monitor the work carried out in the context of the European Health Data Space.
- Enhance the performance and efficiency of large randomised clinical trials and new models of clinical trials by **developing standardised processes and methods to access RWD and/or synthetic data** (e.g., facilitating the detection of various types of health outcomes during the treatment period of a double-blinded trial by linkage to appropriate electronic health care record databases, etc.), **for regulatory decision-making and/or health technology assessment**.
- **Define methodological standards for the regulatory acceptability of RWD**, and/or synthetic data in the context of clinical trials augmented with RWD, and/or synthetic data, for regulatory decision making and/or health technology assessment.
- Test the ability of machine learning methods to help identify relevant RWD, and/or synthetic data to match with and to interpret clinical trials, for regulatory decision-making and/or health technology assessment.
- Assess and validate how machine learning methods can be systematically harnessed to screen a large amount of data, including unstructured data, in many electronic databases to identify factors affecting efficacy and safety of treatments and/or digital health innovations, for regulatory decision-making and/or health technology assessment. The cross-border interoperability dimension should be taken into account.

Proposals should involve researchers who are specialised in the use of real-world data and/or synthetic data to evaluate medicinal products and/or health care digital innovation products and services. Proposals should involve national competent authorities (national health care product regulatory bodies and/or medical device notified bodies) and could involve citizens and patients'

representatives where relevant. **Proposals should include capacity-building efforts to address inequalities of health regulatory processes across Europe. This should comprise education and training activities and sharing of best practices**.

In addition to national competent authorities, proposals could consider the involvement of the European Medicines Agency (EMA) for an added value in order to provide an effective interface between the research activities and regulatory aspects and/or to translate the research results into validated test methods and strategies that would be fit for regulatory purpose.

Proposals could also consider the involvement of the European Commission's Joint Research Centre (JRC) to provide added-value regarding health registry data, interoperability, harmonisation and quality and linking with other data.

Type of action	Research and Innovation Action
Deadline	**21 April 2022**
Expected EU contribution per project	EUR 7.00 million
Topic information	Link

Call – **A competitive health-related industry**

HORIZON-HLTH-2022-IND-13-03: New pricing and payment models for cost-effective and affordable health innovations

Expected outcome

This topic aims at supporting activities that are enabling or contributing to one or several expected impacts of destination 6 "Maintaining an innovative, sustainable and globally competitive health industry". To that end, proposals under this topic should aim for delivering results that are directed, tailored towards and contributing to all of the following expected outcomes:

- Health authorities and insurers adopt new payment models for health technologies, including pharmaceuticals.
- Health industries anticipate better the marketing conditions for innovative health technologies. Patients and health care providers have faster access to innovative health technologies.
- Health authorities, insurers and health care providers have affordable innovative health technologies both on short and longer terms.

Scope

Applicants are requested to propose new value-based pricing and reimbursement models that can help ensure equitable access to effective, efficient, affordable, and sustainable health technologies, including medicines, while supporting innovation and industrial competitiveness. The research should tackle the issue globally and be based on a multidisciplinary approach combining economic science, political science and sociology. The proposals should not be limited to the study of cost-effectiveness analyses and thresholds in decision-making. They should also address long term intended and unintended consequences of pricing and reimbursement decisions. Moreover, they should consider the potential limitation of no-coverage decision for products with high budgetary impact. Applicant consortia should include regulators and public entities that are in charge of attributing value tags to health technologies, negotiating with health technology manufacturers and/or reimbursing medical costs. Differences between public and private sectors could be considered, as appropriate. Proposals should also consider citizens engagement and dialogue, for seeking wider input and support, and could encourage other social innovation approaches. **Applicants should propose activities in all of the following areas:**

- **Affordability of health innovations.**
- **Variety of pricing/payment schemes in the EU**.
- **Cost-effectiveness and budget impact** (including life-time indirect medical costs).
- **Impact of payment schemes** (e.g. pay-for-performance/multi-annual instalments) **on long-term competition in health technology markets**, in particular the pharmaceutical market.
- **Potential influence of post-launch evidence-generation plans agreed with regulators and downstream decision makers** (HTAs, payers) **on the payment models.**
- **Transparent and comprehensive assessment of technology and medicine development costs**, taking into account public investments and incremental character of some innovations (e.g. new indications).
- **Development, integration and harmonisation of tools that allow for validation and revision of clinical evidence and cost-effectiveness, and long-term financial planning for effective and transparent decision-making.**
- **New methods for definition of cost-effectiveness thresholds, integration of greener production and environmental impact, rational applications in real world contexts, comparative analysis of influence in decision-making and influence in the formulation of prices of technologies.**
- **Potential equity issues derived by payment models and the measures for their mitigation.**

Type of action	Research and Innovation Action
Deadline	**21 April 2022**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

Topics with minor SSH relevance

HORIZON-HLTH-2022-IND-13-04: Setting up a European Smart Health Innovation Hub
Link

Cluster 2

Culture, creativity and inclusive society

Call – Reshaping democracies

HORIZON-CL2-2022-DEMOCRACY-01-01: Artificial intelligence, big data and democracy

Expected outcome

Projects should contribute to at least two of the following expected outcomes:

* Protect fundamental rights and European values from possible threats stemming from unregulated use of artificial intelligence (AI) and big data applications.
* Explore the potential of AI and big data to reinforce fundamental rights and European values. Examine the effectiveness of monitoring and control protocols of established legislation and non-regulatory measures over AI and big data development and implementations.
* Introduction of values-based frameworks to inform data governance and regulate the use of AI and big data.
* Innovative uses of AI and big data to enhance citizen engagement and democracy.

Scope

Big data and AI are shaping our societies at an unprecedented rate. We produce an ever-increasing amount of data revealing people's attitudes, preferences, views and opinions. Public and private actors collect it and use it in multiple ways: e.g. companies "privatise" data to augment commercial returns while, on the other hand, state actors can use it for safety and security applications and the public sector to provide better, tailored services to citizens.

AI and big data open great opportunities in many fields of public interest: education, training, health, safety and security, public services, as well as for democratic processes and civic participation. However, both private and public uses contain some risks at the expense of citizens' rights. These technologies, being at the forefront of datafication processes, pose new challenges both to core individual values such as privacy, freedom and equality, as well as to European collective values, such as fairness, security, inclusiveness, accountability and democratic control.

Proposals should analyse challenges and opportunities for society brought about by AI and big data. They should explore how to protect citizens from potential abuse enabled by these technologies both in the private and public domains. **New and established regulations to control platforms using these technologies (beyond GDPR) should be examined. Strategies and policy recommendations on how to ensure that philosophical, legal and ethical values are embedded in the development of these technologies** as outlined in the White Paper on Artificial Intelligence – a European approach to excellence and trust, **are sought. Examination should lead to solutions protecting from the possible negative impacts of these technologies on fundamental rights and democracy. Equally, it should lead to strategies that leverage them for enhancing civic participation and democracy.**

Issues at stake include, inter alia: **data ownership and/or inalienability**; **regulation of data flows**; neutrality and explainability of algorithms and machine learning; value-centric, decentralised and/or open source designs for data processing platforms; counter-powers to dominant platforms; sensitive applications such as face recognition; etc.

Proposals are expected to address some of the following points: To build evidence, to review and to analyse threats to and opportunities for democracy, personal and collective European values stemming from AI and big data. This should involve a specific focus on gender issues and vulnerable populations, including persons with disabilities and people at risk of discrimination. **They should propose ethical standards enforced through regulatory and governance frameworks**. Supported with operational guidance, they should help protect citizens, uphold European values and ensure public trust in AI and the processing of big data. Innovative, inclusive and participative uses of AI and big data for civic engagement and democracy, including through experimental approaches, should be explored. Research is expected to design ways to educate European citizens about these technologies to enable informed civic participation in shaping them. Projects should build on existing results, findings and good practices, for instance those focused on Responsible Research and Innovation, and relevant projects supported under Horizon 2020's Science with and for Society programme.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – **Reshaping democracies**

HORIZON-CL2-2022-DEMOCRACY-01-02: The future of democracy and civic participation

Expected Outcome

Projects should contribute to both of the following expected outcomes:

- Enhance and expand the implementation of civic participation as well as co-creation in democratic life at scale, including the least engaged communities and categories of the population, at all levels from local to European.
- Improve the articulation between deliberative processes and representative institutions in liberal democracies, including through experimental approaches. Research should elucidate how to open up traditional institutions of representative democracy and increase trust in democratic governance through direct participatory processes as well as clear and transparent feedback mechanisms to citizens.

Scope

Civic participation is researched through a significant number and variety of projects under Horizon 2020, including research on co-creation of digital public services with citizens, on which further research and innovation can build. At the same time, this is a fast moving field as spontaneous forms of participation continue to emerge, such as youth movements for climate and sustainability, movements for racial justices and innovative forms of participation such as citizens' assemblies. The COVID-19 pandemic crisis is continuously demonstrating the extent to which science and innovation policy needs to be at the core of exchanges between citizens and government through a participatory political process. This also includes the need to use digital means to engage citizens as societies are urged to move online and the need to engage citizens in the rapid digitalisation of governments as a reaction to the COVID19 crisis. Social entrepreneurship is another significant trend attempting to achieve societal or political impact through individual initiative. More digital and organised participatory and deliberative processes are also being tested and implemented in many local, national and even European and global contexts.

The interface between these movements and processes and the representative institutions of liberal democracies has often been chaotic or conflictual. However, attempts are also made to improve these interactions and embed them in formal mechanisms. The digitalisation of societies and their governments poses an opportunity to reinforce civic participation.

Major challenges to civic participation include engaging the disenfranchised, structurally marginalised, or less spontaneously engaged parts of society, and channelling protest into non-conflictual, constructive engagement. Reaching out to them and ensuring that their voices are heard and listened to in the democratic debate, is key to guarantee the fairness and inclusiveness of our political systems.

Proposals are expected to address some of the following points: To review available historical evidence and more recent experience with various forms of civic participation in Europe: from spontaneous forms of engagement to organised participatory and deliberative processes; from traditional types such as participation to political parties and organised civil society to newer ones such as social entrepreneurship and digital tools of civic participation; the role of formal and informal grassroots initiatives; the role of social media and new technology in civic engagement; the use of public spaces. It is strongly encouraged to cover different scales of participation, from local to national, European and even global. Analysis is expected to review and compare the forms, depth and effectiveness of civic engagement on different topics of political life and different stages of the policy-making process, ranging from local issues such as spatial planning to international policy matters and issues traditionally considered as 'reserved' to experts or policy professionals, such as agenda setting in research and innovation policy making. Research should apply foresight methodologies to study how civic participation could be impacted by future changes in global governance and the increased digitalisation of societies and their governments. How different types of civic engagement can complement and reinforce each other may be explored. Consider as well how the educational system can support inclusive citizenship, with a view to ensure as extensive, inclusive and impactful participation in all aspects of democratic life.

Proposals should include a specific focus on inequalities in civic participation, including ethnicity, gender, intersectionalities and digital divides, and explore and propose remedies. They should examine how civic participation and co-creation in its various forms, including social activism and social innovation, articulates with the traditional mechanisms and institutions of representative democracy, including acting outside them. Proposals should reflect on the potential of digitalisation and new ICT for enhancing citizen participation, including for public policy making processes. They should propose ways to improve the interaction between policymakers and citizens to enhance the public sphere, including robust and transparent mutual feedback between policymakers and citizens. Proposals are encouraged to include experimental research and design thinking to test the insights gathered and to deploy innovative solutions to demonstrate the solutions proposed. Social innovation might be also considered by proposals if solutions require social change, new social practices or social ownerships.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million

Call – **Reshaping democracies**
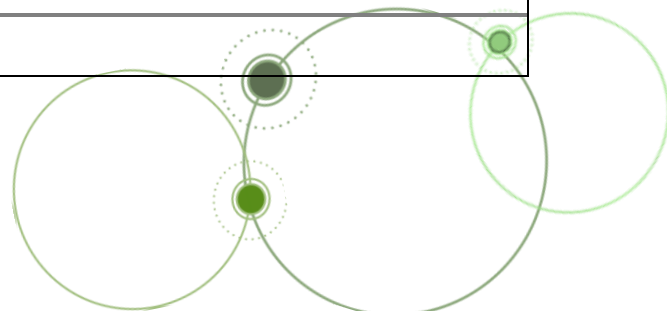
Topic information	Link

HORIZON-CL2-2022-DEMOCRACY-01-03: The impact of inequalities on democracy

Expected outcome

Projects should contribute to all of the following expected outcomes:

- Comprehensive evidence base to explain the long-term impact of various inequalities (socio-economic, gender, disability, spatial, ethnic, etc.) on political participation, democratic quality and stability.
- Development, validation and piloting of strategies, policies and action plans for tackling inequalities while boosting trust and resilience at different levels of governance, including at the local level.
- Strategies, regulations and policies to support the inclusion of marginalised groups in the democratic and participatory process.

Scope

Citizens, especially in certain social groups, have been experiencing an erosion in living standards over the past decades. This process has persisted during the financial recovery and is likely to worsen following the coronavirus pandemic. At the same time, social mobility stalled and the impact of inequalities increased. This has reinforced sentiments of public distrust towards the political institutions of democracy. European research suggests that a shrinking of private and public resources due to economic downturns can lead to disenchantment from politics, and even to a general deterioration of the rule of law.

Moreover, persistent inequality has lifelong effects for children and undermines the ability of the more socially vulnerable and excluded to participate meaningfully in the political process, while economically powerful actors gain a greater influence. Social, economic, spatial, ethnic or gender inequalities often translate into political inequalities, especially if different areas of inequality (e.g. in economic opportunities, access to education, health and social security) are overlapping. There is a danger of having a long-lasting fissure in the egalitarian ethos of democracy produced by the almost permanent political exclusion of wide social groups. Particular attention should be paid to children and youth, who are particularly vulnerable to the effects of recession, and for whom the structuring effects of inequality and unequal opportunities may have lasting consequences in terms of education, work and life chances.

Proposals are expected to address some of the following points: To take stock of long-term trends in and types of inequalities (socio-economic, gender, age, spatial, digital gaps, ethnic, linguistic, etc.), as well as to identify the sources of these inequalities and the way they intersect. Proposals should model the relation between inequalities and levels of political trust in European societies and the emergence of protest movements and populist discourses, including in their national, transnational and spatial dimensions. What set of policy actions can enhance equality and political engagement amongst the socially excluded and vulnerable, including children and youth? The processes that allow or prevent these groups' interests and demands from entering the political agenda should be examined. Research should relate different kinds of policies (economic, access to education, housing, employment, etc.) and the role of public services, including digital ones, to levels of democratic legitimacy and trust among different social groups, including with a spatial perspective (e.g. rural vs urban). It should also relate the structure of political representation (e.g. how much are governments, parties, parliaments, etc. representative of different social categories; the discourses of major political agents and their social relevance) to levels of political engagement and democratic legitimacy. Based on the evidence collected and analysed, proposals should develop validation and piloting of strategies, policies and actions to tackle inequalities and to reinforce the inclusion of marginalised groups in the democratic and participatory process, including increased involvement of marginalised groups in the creation of digital public services. Active involvement of citizens and socially innovative approaches are strongly encouraged.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – **Reshaping democracies**
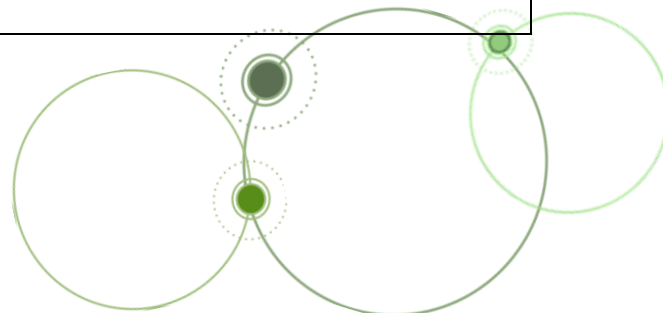
HORIZON-CL2-2022-DEMOCRACY-01-04: Education for democracy

Expected Outcome
Projects should contribute to all of the following expected outcomes:
- Build robust evidence base for redesigning curricula in support of democracy, with an emphasis on students' active participation and engagement in this process.
- Toolkits for enhancing the humanistic and civic aspects of education with a view to promoting active democratic citizenship and empowerment, including through experimental approaches.
- Strengthened democratic processes in education through the involvement of citizens in defining educational contents, learning environments and goals.

Scope
Education, from early childhood to lifelong learning, plays an important role in bolstering democratic citizenship and strengthening the resilience of democratic societies. It can play an essential role in the promotion of core values like human rights and the rule of law, as well as in the prevention of human rights violations. It can also help promote gender equality, disability inclusiveness, a culture of peace and non-violence, environmental awareness, appreciation of linguistic, ethnic, cultural and religious diversity. Education can contribute to tackle radicalisation and successfully integrate migrants and refugees.
Research shows that voters with more extreme attitudes are overrepresented among citizens with low formal education and a below-average household income. Populist discourses and extremist groups find more support among citizens who benefit less from cultural modernisation, economic liberalisation and internationalisation.
Involvement of citizens and young people, including through NGOs, social partners and grassroots organisations, and cooperation with cultural and creative sectors are strongly encouraged to ensure the achievement of expected outcomes.

Proposals are expected to show how educational material and innovative pedagogical practices in different settings (including lifelong learning), can mediate or inform current debates about European identity, as well as key issues such as sustainable development, migration, tolerance and understanding of ethnocultural and linguistic diversity, international solidarity and global citizenship, inequality, disability, hate speech, polarisation and extremisms, ethnicity/race, religion and gender, etc. They should examine how education can be mobilised in terms of producing informed historical and cultural consciousness by contributing to cultural and textual literacy, critical and analytic historical learning, responsible historical consciousness and critical thinking of the future citizens of democratic societies. Research should highlight the competences needed by students for boosting their capacity to actively engage in democratic politics, to understand and reflect on global interconnections, unequal power relations, depletion of natural resources and climate change, and to contribute to the promotion of sustainable development, inclusion, anti-racism, equality, justice and peace. Corresponding methods to guide teaching and assessment of those competences should be investigated, gathered and analysed. Research should propose avenues for updating and developing novel curricula and learning environment. It should also propose ways to support teaching staff, with a view to bolstering democratic values, critical thinking skills and positive social engagement in a holistic way. Provide comprehensive evidence from European countries on the links between economic, social, cultural capital and educational inequalities and levels of political engagement, social trust, participation and inter-cultural tolerance. Experimental participatory research to test educational and training tools and to demonstrate the impact of the tools proposed, including students' and teachers' feedback, should be included. In particular, proposals should examine new (including blended) education and training formats that incorporate creative approaches such as gamification, design of virtual classrooms and virtual co-working spaces, and other cultural expressions like literacy interpretation, creative writing or theatre, in order to reach target groups in an effective and innovative way.

Type of action	Research and Innovation action,
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – **Reshaping democracies**
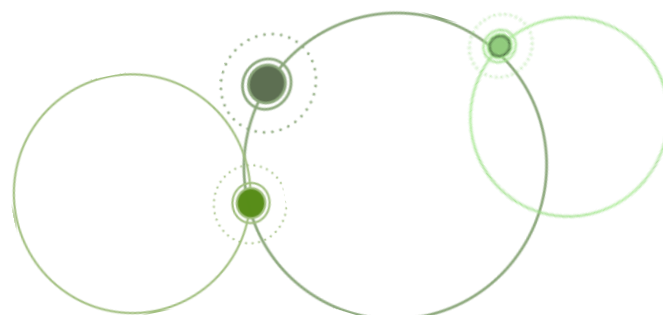
HORIZON-CL2-2022-DEMOCRACY-01-05: Evolution of political extremism and its influence on contemporary social and political dialogue

Expected outcome

Projects should contribute to both of the following expected outcomes:

- In-depth understanding of the major factors contributing to the present rise of extremist narratives and of their influence on mainstream worldviews, discourses and policies across European countries in their local and global context.
- Formulation of multi-level policy recommendations to help counter these extremist narratives while limiting their spread and impact.

Scope

The COVID-19 crisis risks further strengthening extreme political narratives that have already been rising starkly across Europe. These narratives fuel the demand for more protectionism, nation-state localisation of production and tougher frontier controls, while depicting foreigners as a threat to national wellbeing. On an ideological plane, political extremists often show disdain for the rights and liberties of others but resent the limitations of their own activities. More extreme forms embrace engagement in ideologically driven criminal activity and violence.

Some of the greater impacts of extreme narratives on society stem from their influence on mainstream political discourses and policies. This phenomenon is notably reflected by alarming outcomes in national and European opinion polls and elections. Therefore, the phenomenon seems to belong to a wider trend and should be analysed in its local and global contexts, including in connection with the strengthening of authoritarian, populist and extremist discourses in some countries. Certain anti-democratic sentiments also seem to be connected to and nurtured by conspiracy theories, possible bonds that could be flagged and examined for comprehensive understanding of all interacting factors.

Proposals are expected to address the following: Analyse the various forms of extremist discourses and narratives, their dynamics and disruptive potential. Take into account national specificities – embedded in their historical, social and cultural contexts – and transnational influences, within Europe and globally. Provide psychological, sociological and anthropological analyses of drivers behind violent political transformations. Explore the tension between tackling political extremism and human rights law on freedom of speech. Map the penetration of extremist ideology and argumentation into general media, social and political discourses. Proposals should analyse the drivers of such discourses, including the respective roles of the media, political spheres and popular sentiment and their interplay. They should propose evidence-based strategies to counter extremist discourses, prevent the spread of political extremism and limit its short and long- term impact. The action should develop corresponding policy recommendations.

Type of action	Research and Innovation action,
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – **Reshaping democracies**

Dedicated Topic
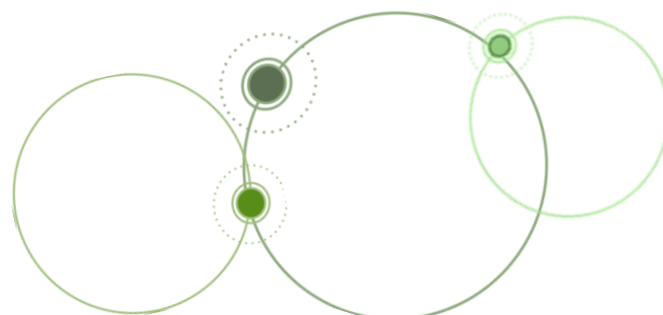
HORIZON-CL2-2022-DEMOCRACY-01-06: Media for democracy – democratic media

Expected outcome
Projects should contribute to all of the following expected outcomes:
- Demonstrate how citizens and policymakers can contribute to a healthy and reinvigorated democracy through media.
- Improved quality, accountability and transparency of media production and distribution processes, and contribution to a more resilient democratic institutional framework.
- Enhanced citizen's participation and decision-making through enlightened access to pluralistic media content.

Scope
A robust, independent and transparent media landscape ensuring a plurality of views is an essential part of a functioning democracy. Through control and criticism, offering a stage for the competition of ideas and interests and promoting political participation, inclusion and responsible action of citizens, the media can be a powerful source of legitimation and external check on incumbent authorities. As recalled by the recent European Democracy Action Plan adopted by the European Commission, media plays a central role as the "fourth pillar of democracy" by informing citizens and holding public institutions and businesses to account as well as by enhancing democratic values such as pluralism and tolerance.

Media accountability (enacted by mechanisms such as press and media councils, ombudspersons, etc.) and professional journalism have a key role in democratic societies for safeguarding a free and responsible media. In light of an increased economization of media communication, increased market concentration, and the accelerated technological changes including automatised content selection and sharing processes, the established system of media accountability seems to be at a crossroads that requires innovative ideas for improvement. Research should thus examine the political role of traditional and new digital media in performing key democratic functions and reaching out to all segments of society, including women as well as minorities and disadvantaged groups. The cultural and creative sectors may be actively involved in the research.

Proposals are expected to address some of the following: they should examine under what conditions, including training, career and working conditions, traditional and new media organizations and journalism operate in modern European societies. Research should analyse whether and how they serve the public interest, and how this could be improved through better training, reinforcing ethical standards and competences (including those related to journalists' professional dilemmas), media regulation and rules, and cooperation between stakeholders (including professional training institutions, media houses, industry). Proposals should focus on the implications of modern, technologically mediated configurations for the political agency of citizens. Relevant foci could be media participation and civic engagement, journalists' professional and ethical standards, the role of education and training in fostering critical media literacy, persuasive technology, inequality (including gender inequality) and exclusion, institutional politics and activism, and populism. Changes in media markets and the role of economic, commercial, technological as well as political forces in shaping current changes in the role of media should be analysed. Proposals should bring together, in a holistic manner, academic research, practitioners' reflection, and citizens' views on the relationship between media and democracy. They should analyse how recent transformations in journalism and media technology have affected individuals and communities concerning participation and democratic discourses and, conversely, how a shifting political landscape, with increased polarisation as a major trait, have affected the media. Research should propose digital media design improvements that effectively increase transparency and accountability of media and contribute to reinvigorating democracy.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – **Reshaping democracies**
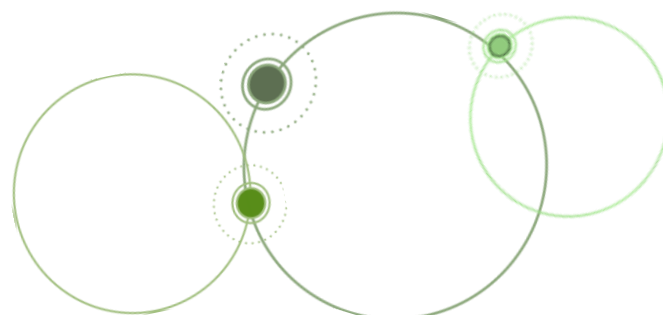
HORIZON-CL2-2022-DEMOCRACY-01-07: Politics and the impact of online social networks and new media

Expected outcome

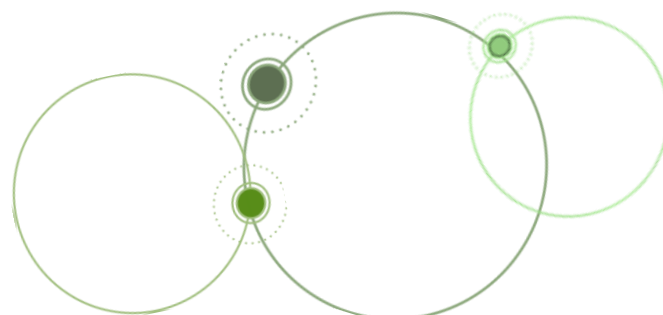Projects should contribute to all of the following expected outcomes:

- Understand the changes wrought on democratic processes by new technologies.
- Produce evidence-based recommendations to address the opportunities and challenges for political behaviour and democratic engagement presented by social platforms and new media.
- Enhance capacities for digital citizenship.

Scope

Social media and other internet-based platforms are intertwined with political life. They play an important role in allowing people to design, consume and share political news, seek political information and discuss, make decisions, donate money, or engage with political parties and other organisations. Furthermore, these platforms and media are supposed to open new avenues to political engagement and democratic participation. However, developments in the recent past have created anxieties about their capacity to protect citizens from disinformation and to serve as balanced and open public fora for democratic debates. Social platforms and new media are increasingly perceived as conducive to the creation of ideological "echo-chambers" eroding the space for public dialogue. They are seen as fostering polarisation, radicalisation, depoliticisation, spreading misinformation and subject to manipulation. At the same time, they have been used in attempts to covertly influence the political choices of citizens, thus sapping their democratic credentials.

Proposals are expected to address some of the following: they should build Europe-wide evidence on the extent to which political opportunities and information offered by platforms and new media – and resulting impacts, such as the "echo-chambers" effect – affects political attitudes in European states and at the level of the EU and its neighbourhood. Whether and how new media functions as a new level of news selection and study the resulting perception biases with citizens should be assessed. Research should examine the extent to which platforms and new media actually help democratise political systems and offer avenues of active engagement, or hinder participation for some. The effects of the replacement of media consumption with content consumption should also be examined. Proposals should investigate how audiences of different ages, different genders and different socio-economic and ethnolinguistic groups receive and assess information on digital platforms, and how political actors use these platforms to shape political behaviour. They should propose and design regulatory innovations in response to the covert use of social platforms for political goals. Evidence-based approaches and methods for enhancing capacities for digital citizenship, including media education, media competences, and digital literacy should be developed. Insight about the effects of social media on social behaviour should be attained. Citizen science and other innovative and participatory forms of research could be appropriate for this action.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – **Reshaping democracies**

HORIZON-CL2-2022-DEMOCRACY-01-08: Representative democracy in flux

Expected outcome

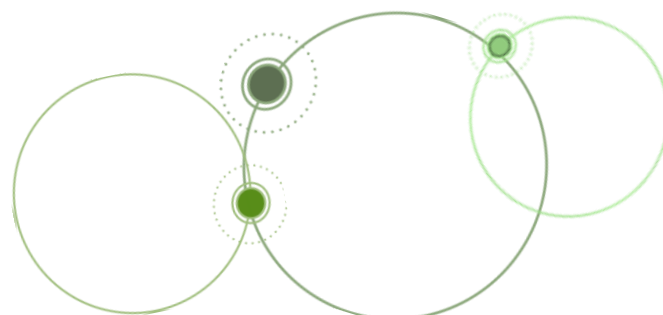Projects should contribute to both of the following expected outcomes:

- Comprehensive evidence on the mid- to long-term impacts of current political and social developments on European representative democracies.
- Develop policy recommendations, toolkits, narratives and methodologies for enhancing trust in political institutions, and boosting transparency, representativeness, and inclusiveness of representative systems at local, regional, national and EU level.

Scope

The last decades have witnessed significant changes in the electoral behaviour of citizens. Turnout has been steadily declining in most countries while European research and statistical data show that there is more electoral volatility, together with an increase in radicalisation of voter attitudes and greater polarisation. From 1994 to 2017 (according to Eurobarometer data 15) trust in parliaments, political parties and governments declined significantly. On the other hand, paradoxically, non-elected institutions (e.g. military, police, and judiciary) enjoyed high and relatively stable levels of trust, higher than the democratically elected ones. As societies have become more connected and individualistic, with an ever fastpaced development of digital technologies, new political forces, discourses and voting preferences have emerged. While many of the identities and certainties of the past are eroding, new cleavages have marked the political landscape of representative democracies. This apparent state of flux brings multiple challenges but also opportunities for the future of our democracies.

Proposals are expected to address some of the following: to create a robust and comprehensive knowledge base on long-term developments in terms of trust in, and trustworthiness of, the political institutions of representative democracy – parties, executives, parliaments, judiciary, social partners, institutionalised social dialogue, etc. – and their legitimacy. Proposals should relate changing voting attitudes at the individual level to wider political and cultural discourses, where feelings and emotions can compete and overrule facts and reasons, and to the emergence of new social movements and parties. They should analyse key drivers of such changes, taking into consideration socio-economic variables (including transformation in the world of work), as well as cultural variables linked to identity, generational differences, gender, ethnic diversity, security, migration and the material forms of discourse such as education and media. The political cleavages that shape current political phenomena and trace their connection to historical legacies as well as their foreseeable negative and positive long-term impacts on democratic systems should be analysed. Based on the evidence collected and analysed, proposals should develop new approaches to understand the evolution of political parties in the context of intense digitalisation (including of the public space and public institutions) and individualism. They should examine the barriers and opportunities to re-invigorating and enhancing representative democratic systems. Strategies to address the demands and needs of citizens expressed in other, nonelectoral forms of political participation, with a view to active engagement and inclusion, including the use of digital tools for citizen engagement should be provided. Research should develop a comprehensive and transparent toolbox of possible policy interventions including but not limited to recommendations, toolkits and methodologies for enhancing trust in political institutions, boosting transparency, representativeness and inclusiveness of representative systems. In all cases, comparative approaches at EU level, taking also into consideration the changing demographic composition of populations, should be developed. The actions should strive to include citizens and civil society at all stages of the research activities, by means of consultation, structured dialogue, action research, social experimentation and/or other active methodologies that the proponents consider as most effective.

Type of action	Research and Innovation action,
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – **Reshaping democracies**

HORIZON-CL2-2022-DEMOCRACY-01-09: Global governance for a world in transition: Norms, institutions, actors

Expected Outcome

Projects should contribute to the both of following expected outcomes:

- Support the European Union's role in leading the transformation and defence of multilateralism by identifying and analysing policy avenues for a more robust, democratic and effective global governance.
- Develop policy recommendations, institutional frames, toolboxes, narratives and methodologies for supporting action towards transnational democracy.

Scope

Political developments across the world over the last years have posed serious challenges to global multilateralism and its aspirations for global order, peace and cooperation. Even if the need for international collective action is greater than it has ever been (climate and digital transitions, rise of inequalities – including gender inequalities –, ageing and disabilities, migrations, health pandemics, information disorder), the obstacles it encounters are no less redoubtable. The emerging multipolar system is characterised by the prevalence of diverging, and often antagonistic, state preferences, outdated and often illequipped global governance institutional architecture, nationalist populism, unilateralist trends, the influence of multinational corporations, as well as neo-mercantilist conflicts. The European Union has an important global role to play in terms of defending multilateralism, through its enhancement and transformation, as a crucial component of global governance. However, its capacity and influence in shaping globalisation are being shaken by major geopolitical factors, such as the rise of new or re-emerging powers (China, India, Russia) and the United States' foreign policy shifts.

Taking stock of recent developments, research should propose ways of redesigning, renewing and re-invigorating global and European traditions of cooperation with a view to greater accountability, openness and legitimacy. This should include new reflections on the norms, institutions and actors that can support a more robust and effective multilateralism, as well as a stocktaking and assessment of the modalities and possibilities of multileveled participation in cross-border governance, ranging from the local to the global level. Research should also account for differences between fields and areas of governance, corresponding to diverse levels and modalities of multilateral cooperation. It should analyse whether and how such differences may hamper the governance of intersecting global challenges, e.g. health and mobility in relation to the recent COVID-19 pandemic, sustainability and climate change, and propose ways forward.

Proposals are expected to address some of the following: to identify barriers and opportunities for re-invigorating and enhancing the formal legal and institutional architecture of the rulesbased global system. They should analyse, through a mix of normative and empirical methodologies, ways to reinforce the institutions that work, ways to replace those that do not, and propose those that are missing, with the aim of spurring the transformation of global governance. Proposals should relate the capacity of the populist and nationalist actors to feed on sovereigntist claims and narratives about the challenges confronted by supranational integration projects. Comparative approaches at European and global levels should be developed, taking into consideration historical and cultural contexts. Research should identify new actors, norms and processes of participation and representation (such as the participation of local authorities, community-based organisations, trade unions, youth, women's rights and civil society organisations in general, or citizens themselves through digital means for instance), which can boost the legitimacy, transparency, representativeness and effectiveness of multilateral institutions. Interests and strategies of other international powers, such as the United States, China, India, Russia or of other regional groupings (e.g. Mercosur, ASEAN, African Union) in disseminating new collective norms for global governance, including the related relevant historical roots, should be analysed. Proposals should identify where these interests, strategies and norms are incompatible with EU values and long-term interests and recommend policy action for the European Union to counter them. They should reflect on the changing role of state sovereignty in times of globalisation and global governance and consider different ways of reconceptualising multilateralism in the emerging multipolar global system. International cooperation with partners from third countries of interest is encouraged in order to better achieve the expected outcomes.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link
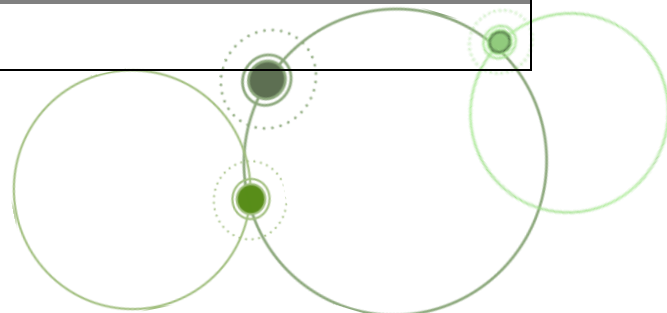
HORIZON-CL2-2022-HERITAGE-01-01: Safeguarding endangered languages in Europe

Expected Outcome

Projects should contribute to at least two of the following expected outcomes:

- Enhance cooperation at the European level between key actors and stakeholders within endangered languages communities.
- Empower local communities and promote citizens' engagement in the sustainable management of their own linguistic resources, in line with the principles of the Faro Convention.
- Suggest strategies to involve young people in the (re)discovery of their linguistic heritage and its importance for the development of their identity and community building.
- Promote equality and linguistic diversity in line with the EU's motto 'United in Diversity' and its work to reinforce the central role of multilingualism in Europe.
- Strengthen the identification, inventory and transmission of regional, minority and local languages as vehicles of oral expressions and traditions, in line with the principles of the UNESCO 2003 Convention for the Safeguarding of the Intangible Cultural Heritage.

Scope

Languages, whether they are internationally used by millions of people or spoken by only small and remote communities, are the expression of the identity, culture and the way communities and peoples perceive their world. They are an essential part of the rich fabric of European culture. When languages disappear, our cultural diversity is impoverished. While this risk has been recognised internationally (including by UNESCO, the Council of Europe, the OSCE, etc.), many of the regional, minority and local languages, which are spoken today in the European Union, Associated and Neighbourhood Countries, are in danger of disappearing.

Starting from the analysis of the sociolinguistic, legal and economic situation of European endangered languages, of the reasons behind their endangered status, as well as of past and present policies, the action should propose ways to promote the reawakening of these endangered languages. This implies encouraging and supporting their use as well as their intergenerational transmission. **The project should explore measures in different areas such as the educational, cultural and creative sectors**, and link them with regional development. The use of digital tools is strongly encouraged, as it is the easiest channel to reach and involve society, and in particular young people, in the (re)discovery of their own linguistic heritage, including non-written languages.

The creation of a European language preservation ecosystem is at the heart of this topic, in particular with the establishment of a set of guidelines for revitalizing endangered languages in Europe and the setting up of a comprehensive website. This also aims at exchanging best practices and collecting endangered language resources and tools that, with the appropriate involvement of stakeholders concerned, should be made widely available. A set of identified guidelines should be validated by the use of existing cases of language revitalization. Available results of research already undertaken on language revitalisation should be taken into consideration, while identification of needs for further research in the field should be promoted. Examples of grass root movements that foster the engagement of local communities and, in particular, of young people, to learn and use such languages should be analysed and their motivating factors examined. These good practices should be taken into account when developing methodologies, in order to enhance them and to make them adaptable to local situations. Participation of regional or local communities and/or administrations, civil society, universities and other research institutions, networks and platforms working on multilingualism as well as on the promotion of regional and minority languages are encouraged and will ensure efficient and comprehensive bottom-up solutions.

Type of action	Coordination and Support Action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link
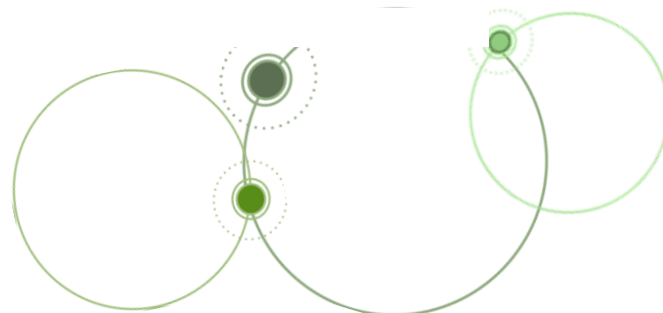
HORIZON-CL2-2022-HERITAGE-01-02: Europe's cultural heritage and arts - promoting our values at home and abroad

Expected Outcome:

Projects should contribute to at least one of the following expected outcomes:

- **Better awareness and understanding of European arts, culture and values within the EU and internationally** by leveraging the creativity of arts and cultural heritage partners in Europe.
- **Wider exposure to the diversity of European art, culture and values for European and international partners,** by strengthening links with creative industries and other parts of the economy.
- **Reinforced common European action to promote Europe's culture and economic interests internationally,** hence contributing to strengthen European competitiveness.

Scope

European arts and cultural heritage have an intrinsic value in enriching our lives, but also reflect our way of life, and contribute to shaping our society and its values. They are important elements of our creativity and innovation, on which we build economic growth and social development. They also have a role in shaping the way Europe is perceived from afar, thus being important assets for our "soft power" and for promoting Europe's place in the world. If Europe wants to maintain its place in a globalised world, it is in our interest to step up common efforts to promote Europe's culture, values and interests.

However, we are not necessarily aware of, or appreciate, the diversity of European arts and cultural heritage and its important role in democratic society. The challenge of research is to contribute knowledge as well as to identify ways of reinforcing common European action for the benefit or our society. **New and creative approaches may be required to broaden its attractiveness and reach – e.g. contemporary art forms, design, modern technology and media.** Similarly, exposing international audiences more widely to European art, culture and values could raise interest, recognition and potentially lead to increased competitiveness. Cooperation with cultural and creative stakeholders, e.g. artists, actors and designers is encouraged to attract and engage the public and in particular young people.

Europe is in global competition for markets and investments, where industrial and service competitors use every available tool including cultural policy and cultural diplomacy in their international promotion efforts. European research, in cooperation with cultural and creative sectors and a wide range of stakeholders, should contribute new knowledge as well as identifying ways of reinforcing common European action to promote Europe's culture, values and interests for the benefit of our societies and prosperity. Digital solutions and cutting-edge technologies should be considered. In order to draw lessons for policy, it is important to assess the actions of competitors, while evaluating the effectiveness of the common European action and its potential. Research should contribute to identifying ways of more effectively promoting common European interests at a global level, leveraging resources and forging closer cooperation between cultural, creative and economic partners.

Type of action	Research and Innovation action,
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – Research and Innovation on cultural heritage and CCIs
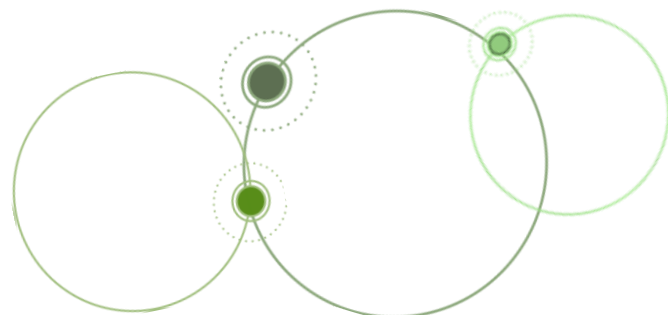
Dedicated Topic

HORIZON-CL2-2022-HERITAGE-01-03: The role of perceptions, formed by traditions, values and beliefs, in shaping European societies and politics in the 21st century

Expected Outcome

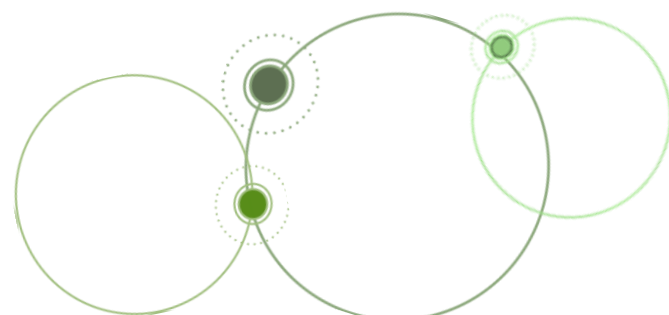Projects should contribute to all of the following expected outcomes:

- Analyse the different factors that form and change people's perceptions, such as beliefs, values, traditions, economy, history, culture, age and gender, among others
- Understand in which way these factors influence and change people's perceptions, their relationship to Europe's historical and cultural past, and how they can contribute to the creation of a more inclusive vision of cultures and values, both European and global. • Apprehend the way perceptions shape European societies' understanding of and responses to the European project.
- Analyse the ways in which perceptions influence society's response and preparedness during times of crisis, such as the COVID-19 pandemic and its impact on post-crisis European cohesion.
- Provide recommendations to bring EU policy making closer to people, with an emphasis on young people's values and behaviour when perceiving pressing social, economic and environmental challenges.

Scope

Values, norms, traditions, beliefs, our historical past, mentalities, age or gender - to name just a few - shape our perceptions, the way we see our societies and the role of the individual, the state and the economy in it. This means that, while speaking of the same subjects, our underlying understanding of them might vary to a certain degree. This has caused misunderstandings and frictions in the European integration process over time, including inter-generational differences. Research should scrutinize the idea of a socially and culturally coherent Europe. While research has tackled various aspects of this topic, it is however necessary to further undertake an in-depth investigation of the role of these factors in and their impact on the European integration process.

Proposals under this topic will identify and examine the factors that influence and change people's perceptions of the European project over time, under different geographical, political or socio-economic circumstances. Changes may also affect how people's perceptions are expressed and become visible in different media (e.g. social media, language). Research should also address the role of values and socio-political behaviour in perceiving and dealing with emergencies and economic crises, such as the COVID-19 pandemic. Lessons learnt during the COVID-19 crisis and the recovery period could be used to provide policy scenarios for facing future crises and building resilient and sustainable post-crisis societies. Finally, proposals should investigate the role of perceptions in understanding and interacting with politics and political legitimacy in the EU. They should provide recommendations on how to address these different perceptions in the policy shaping and implementation of the EU integration process.

Type of action	Research and Innovation action,
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – Research and Innovation on cultural heritage and CCIs

HORIZON-CL2-2022-HERITAGE-01-04: Traditional crafts for the future: a new approach

Expected Outcome

Projects should contribute to at least two of the following expected outcomes:

- Revive, valorise and foster traditional crafts techniques and combine them with new and emerging cutting-edge technologies.
- Bring together the traditional know-how with new and/or digital technologies to develop improved and new products, services and professions.
- Set up platforms and develop methodologies, curricula, entrepreneurship skills and courses for vocational training, to create jobs and revive enterprises where tradition meets the future.
- Create sustainable relationships and networks between research and heritage sites, cultural and creative sectors, institutions, universities and other research institutions, regional and national authorities, enterprises and other relevant stakeholders, in order to promote innovation, jobs and sustainable growth.

Scope

Traditional artefacts and the old crafts techniques are a significant part of our cultural heritage and arts. They showcase the interpenetrating relationship between material culture and human beings producing or consuming it. Artefacts and traditional objects are cultural products as they store social, personal and cultural memory and knowledge, and they enable the articulation of self-identity in symbolic ways. The transmission and reproduction of traditional know-how is the "conditio sine qua non" for the safeguarding and valorising of these cultural products. Still, they need strong interaction with creation in order to strengthen their impact and attractiveness in society.

The goals of the manufacturing and crafts sector have changed over time. This puts at risk traditional crafts techniques, which are in danger of disappearing, and with them important knowledge and know-how of ancient techniques and materials to produce and restore historic artefacts. Combining old crafts techniques with cutting-edge new technologies opens up new dimensions and opportunities for the preservation and restoration of cultural goods, as well as for new and high quality products and services on the market. For instance, it has been the case with the cooperation of the traditional north Italian fabrics manufacturing and the European high-end fashion industry.

Proposals under this topic should address these challenges by understanding the techniques of traditional artefacts encompassing the full range of materials (stone, ceramic, porcelain, metal, wood, fabric, paper/papyrus, etc.). R&I actions should aim at reproducing traditional artefacts, traditional techniques and know-how by combining them with new, digital and other cutting-edge technologies. **R&I initiatives should identify new areas of application and markets for professions combining traditional crafts with cutting-edge technologies**. **They should develop methodologies to combine these two approaches while bringing together all stakeholders concerned to set up clusters covering proposals for professional training and platforms connecting**, among others, **researchers, craftspeople, enterprises and business innovators, in order to bring new products and services on the market**. Actions should include proposals for curricula to train in these new technologies, combining traditional skills with new technologies and entrepreneurship to succeed on the market, including specific business plans. The participation of enterprises, SMEs and CCIs is strongly encouraged to ensure appropriate and economically sustainable use of the new products.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 3.00 and 4.00 million
Topic information	Link

Call – Research and Innovation on cultural heritage and CCIs
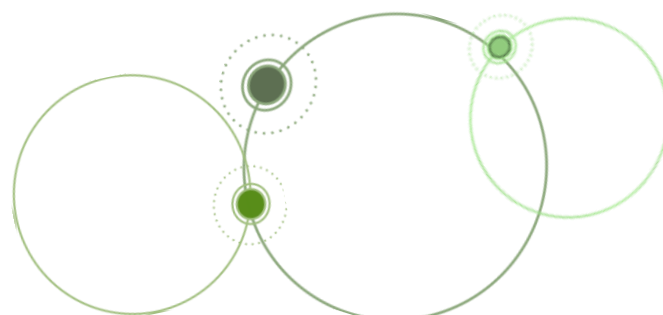
HORIZON-CL2-2022-HERITAGE-01-05: Towards a competitive, fair and sustainable European music ecosystem

<u>Expected Outcome</u>
Projects should contribute to at least two the following expected outcomes:
- **Provide new/improved methodologies for capturing the economic and societal value of music.**
- **Develop indicators to better detect the performance of the European music sector and its contribution to economic and social development,** as well as to sustainability. Promote standardised data collection about the music (sub-)sector(s) to measure the contribution of the EU music sector to the whole economy, the number of employed in the EU music sector, and music consumption on live, broadcast and digital platforms.
- **Increase the transparency of the music industry**, in particular the online/streaming business, through better data provision. Provide an estimation of the impact of music participation to the society.
- **Provide policymakers with effective tools for measuring and enhancing the impact of EU policy making**, in the context of Music Moves Europe and beyond, on the music sector.

<u>Scope</u>
Music has an important economic value, but also a fundamental societal impact, contributing to social development and wellbeing. This is particularly relevant in the case of big economic and social crisis, such as the recent one provoked by COVID-19. Of all the cultural and creative sectors, music has also been the one hit the most from the digital revolution, the reduction of physical sales and the concentration of digital distribution in few big players. The sector is currently bearing dramatic consequences of the COVID-19 crisis. Moreover, the music sector is subject to the fast-evolving consumer behaviours related to cultural content consumption and live performances.

At EU level, support for the music sector comes under the Music Moves Europe initiative (MME) along different strands (programme funding, policy cooperation, regulatory measures, dialogue). The lack of reliable and comparable data to develop a competitive, fair and sustainable European music ecosystem is an underlying issue. Therefore, **proposals should assess and develop appropriate methodologies and perform quantitative, qualitative and statistical analyses at national and EU level to estimate the economic and the societal impact of the music sector.**

Proposals should aim at improving statistical data and methods for capturing the economic impact of the music sector. In estimating the economic value of the sector, proposals should also elaborate on lacking definitions related to national and European repertoire and on methodologies allowing to include, on one side, the many professionals being micro enterprises (and therefore completely excluded from official statistics) and, on the other, big digital platforms, making music available for free via adds or selling of data, that are also not reflected in official European statistics. The results of this research should also show the impact of COVID-19 on the music sector, both live and online. In addition, **proposals should further research on the economy of the streaming models**: while streaming (for free or via a subscription) services are becoming a main access point for music and are expected to grow even further in the years to come, their economic impact on the whole sector in the long term, in particular on the creators, is still uncertain. Proposals should also include in their analysis the impact of COVID-19 on music consumption through streaming platforms. In particular, they should assess whether the catastrophic economic impact of cancelling live music events has translated into a parallel increase in music consumption and revenues for creators and the music sector as a whole. **Proposals should also estimate the economic impact on the music sector of the evolution and future trends of social media platforms and new social media channels**, as well as streaming of live music events and new forms of "home-made creation" production. **Proposals should assess and develop appropriate methodologies to estimate the societal impact of music.** They should map the various forms of music participation: playing, performing, creating and consuming music, and their impact as a source of wellbeing across population segments. Based on innovative approaches and a representative geographic coverage across Europe, proposals should also explain how people engage with music in the age of social media, internet and television across different socio-economic groups.

Type of action	Research and Innovation action,
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – Research and Innovation on cultural heritage and CCIs
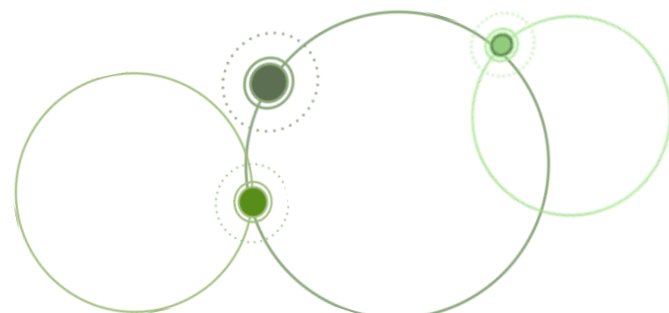
HORIZON-CL2-2022-HERITAGE-01-06: Increase the potential of the international competitiveness of the European filmmaking industry

Expected Outcome

Projects should contribute to at least two of the following expected outcomes:

- New knowledge on the needs and developments of the European filmmaking industry, including its various sub-sectors of pre-production, production, post-production and distribution.
- Provide innovative policy scenarios and tools, including digital ones, for the economic recovery of the sub-sectors affected by the economic recession and the COVID-19 crisis, as well as ways to prevent unemployment in the sector.
- Increase further the competitiveness of the European filmmaking industry in the international arena.
- Provide evidence of the users/viewers preferences on filmmaking, as well as limitations to identifying their preferences, in order to widen and diversify audiences.
- Identify a methodology to better understand the users/viewers preferences on filmmaking.
- Promote European cultural activity and cultural diversity.

Scope

The European filmmaking industry is a significant sector of the cultural and creative industries and an important element of European economic growth and wellbeing. The filmmaking sector encompasses a considerable number of small and medium-size enterprises, which contribute with sizeable revenues to European GDP. The sector's presence in the international arena is dynamic. Although it is in third position on the global market, certain sub-sectors, such as the European animation sector, have a rapidly increasing capacity. However, the lack of large and vertically integrated groups able to compete internationally, in combination with the nationally-based companies that were seriously affected by the COVID-19 crisis, will make it difficult for several EU companies to remain competitive in the international filmmaking industry.

Therefore, **research will examine the state of the art of the European filmmaking industry, in order to analyse limitations, including institutional frameworks** that prevent integration and cause fragmentation. **Proposals will assess the needs and developments of the European filmmaking industry and address potentialities for further development**. Proposals should study the dynamics (e.g. activity, progress) of different sub-sectors of the filmmaking industry, including the sub-sectors of pre-production, production, post-production and distribution, and analyse the reasons why some sub-sectors are less advanced than others. **Elements such as geopolitical relationships should also be taken into consideration in the research**. In addition, **proposals should address the relevant legal framework** that the filmmaking industry has to comply with, in particular related to intellectual property protection, and identify the legal challenges that the EU industry might face. A comparative assessment of the international competitiveness of the European filmmaking industry with that of main competitors (such as the USA, China, India, etc.) should be developed.

Proposals should identify and pilot innovative, scalable and sustainable business models, which will enable the creators to make better use of digital and other technologies and further widen their audience. In addition, they should ensure fair competitiveness and distinctness within the European film environment. Research should also identify how the COVID-19 pandemic, the counter measures and the economic recession have affected those sub-sectors and their workforce, including creators and artists, and **provide policy scenarios on how the filmmaking sector could face the impacts of an economic recession/crisis**, in a cost efficient and effective manner, and by providing fair and sustainable working conditions. Proposals should also investigate the way in which the filmmaking sector can be organised to afford efficiently future economic recession/crisis and unemployment. This might include the identification of technologies that use data lakes, AI, block-chain and other technologies to build new, user-friendly and efficient revenue models around advertising, subscriptions and IPR protection. In this frame, research might consider collaborative platforms, collaborative advertising systems, IPR/copyright tracking systems, common metadata standards, solutions for vertical integration, content aggregation models, common Video on Demand platforms, etc. Evidence on the users/viewers preferences on filmmaking and on limitations to identify their preferences should be provided, while the proposals should identify a methodology, which will also assess the users/viewers preferences on filmmaking. Proposals should cover the activity of cinematography, as well as the wide domain of filmmaking, including TV, documentary, animation, scientific films, etc. Proposals should provide policy scenarios with recommendations for the increase of the competitiveness of the European filmmaking industry at the international arena, thus promoting the European cultural activity and cultural diversity.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 3.00 and 4.00 million
Topic information	Link

Call – Research and Innovation on cultural heritage and CCIs
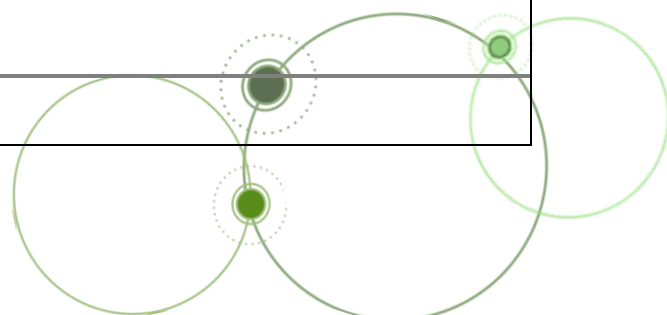
HORIZON-CL2-2022-HERITAGE-01-07: Protection of artefacts and cultural goods from anthropogenic threats

<u>Expected Outcome</u>
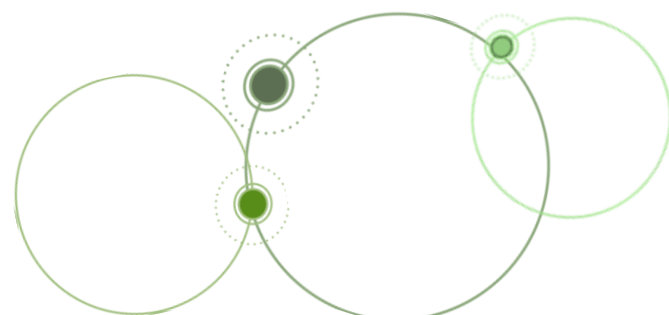Projects should contribute to at least two of the following expected outcomes:
- Develop non-destructive methods and digital tools for the protection, identification and traceability of cultural goods.
- Contribute to the protection, tracing, restitution and safeguarding, as well as provenance research of European endangered cultural heritage.
- Produce evidence-based research to support the deployment of preventative measures against looting and illicit trade of cultural goods.
- Raise awareness, mobilize and further strengthen cooperation among citizens, stakeholders, experts, policy makers and all actors involved.

<u>Scope</u>
Cultural goods and artefacts are put at risk through a number of man-made actions. The underfinancing and neglecting of heritage sites, as well as looting, smuggling and illicit trade of cultural goods, are major dangers threatening to destroy our cultural heritage. In particular, illicit trafficking of cultural goods – although not being a new phenomenon – has expanded dramatically in recent years, especially in areas affected by armed conflicts and natural disasters. The destruction, theft, looting or smuggling of cultural goods could stem from lack of awareness, but is mostly motivated by the pursuit of profit. Very often, it is also linked to a certain ideology that aims to destroy collective memory and dismember people's identity. Moreover, the illicit trafficking of cultural property contributes to the funding of terrorism, organised crime and money laundering. Regulations and legal instruments are put in place to criminalize the offences and penalize the offenders, but research is needed at the level of prevention to protect cultural artefacts from falling victims of theft, smuggling or illicit trade.

To address these challenges, **proposals under this topic should explore preventive actions such as methods** or **technologies/materials of non-destructive marking and digital detection of cultural goods with respect to material and nature of artefacts and ways to identify cultural objects**. The proposed technologies should be sustainable and detectable, preferably without heavy or expensive equipment. Building on existing research achievements, networks and cooperation facilities, projects should contribute to provenance research of cultural heritage, as well as to further awareness raising and mobilizing the actors involved, such as art dealers, auction houses, policy makers, law enforcement agents, stakeholders or citizens. **Proposals are encouraged to include interdisciplinary cooperation with local, regional and national authorities, as well as cultural and creative stakeholders to attract and engage the public, in particular young people**. International cooperation is encouraged as appropriate.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 3.00 and 4.00 million
Topic information	Link

Call – Research and Innovation on cultural heritage and CCIs

HORIZON-CL2-2022-HERITAGE-01-08: Effects of climate change and natural hazards on cultural heritage and remediation

Expected Outcome

Projects should contribute to both of the following expected outcomes:
- Contribute to safeguarding and protecting Europe's cultural heritage from the effects of climate change and natural hazards, including rural and remote areas, coastal and maritime cultural landscapes and underwater heritage.
- Explore innovative and sustainable ways to protect cultural heritage and cultural landscapes from climate change, disaster risks and pollutants.

Scope

Climate change, through consequences such as global warming, rising sea levels, extended dry seasons or floods and heavy storms, is threatening our built heritage and affecting our cultural landscapes. Acid rain and environmental pollution erode and deface monuments and historical buildings. Accelerated soil erosion threatens buried archaeological heritage, while rising sea levels threaten to cover entire cities under water. Solutions provided by research to this day are not exhaustive and could not always anticipate the worsening or newly emerging effects of continuous climate change. Thus, there is a pressing need to explore and test innovative ways to protect monuments, historical buildings and sites from the effects of climate change and natural hazards.

Proposals under this topic should explore innovative and sustainable ways to protect monuments, historical buildings, archaeological sites and cultural landscapes from climate change effects, natural hazards and environmental pollution, taking into consideration their environmental footprint as well as users' comfort. Importance should also be given to coastal and maritime regions and underwater heritage, addressing, in particular, the need for research on wetting phenomena and repellence. Proposals can consider cooperation with European Neighbourhood countries as appropriate for achieving their objectives and increasing impact.

Active involvement of citizens, including young people and cooperation with the cultural and creative industries are strongly encouraged to increase citizens' scientific literacy, raise awareness and ensure the sustainability of the approach.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 3.00 and 4.00 million
Topic information	Link

Call – Research and Innovation on cultural heritage and CCIs
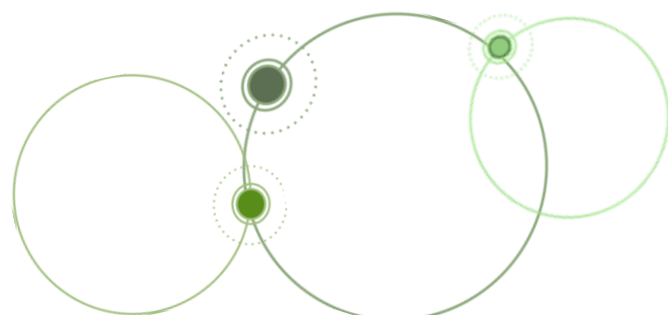
HORIZON-CL2-2022-HERITAGE-01-09: Games and culture shaping our society

Expected Outcome

Projects should contribute to at least two of the following expected outcomes:

- **Evidence of the impact of games on European society, including their cultural value and risks.**
- **Evidence of the innovation potential of games and play (on-line or other).**
- **New knowledge on the role of the games industry and non-commercial creative practices in the EU to benefit society.**
- **Improved knowledge of legal and intellectual property rights issues linked to the gaming population and games industry in the international markets.**
- **Proposals for improving games in terms of positive impact on education, skillsets, responsible business models, employment chances, social cohesion and creativity.**

Scope

Games are fast growing, fast changing parts of industry known for their advanced role in ICT. Yet, although millions of Europeans play these games, the impact of games on European culture and society, as well as on its cohesion and values has not been thoroughly researched.

Research should address these gaps in knowledge, which include possible differences between age groups, gender and socioeconomic backgrounds, the current situation in game literacy or the digital divide. Games are a form of culture where new communication and languages, as well as new artistic expressions, are being developed in particular by younger generations. However, there is limited knowledge about the potential benefits and shortcomings of games in terms of learning and creativity. In today's ever-expanding market, games and emerging forms of play are involved in many aspects of our societies. However, research has neither sufficiently addressed the cultural value, impact, innovation potential, nor the possible risks for individuals and society that games can present.

Proposals should address the risks brought by the digital game world on phenomena such as social exclusion, intolerance and harassment, with a view to possible policy options and actions. **Proposals should address the role of games in culture and in shaping European societies, their cohesion and values, with the objective of developing new knowledge and evidence for policymaking. Proposals should address legal and IPR issues linked to the gaming population and its creative work**. Relevant stakeholders, including CCIs, other creatives, non-commercial interests and policy makers, should be involved to ensure the research and results respond well to the needs. This new knowledge and evidence should provide input for policymaking and for improved practices.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 3.00 and 4.00 million
Topic information	Link
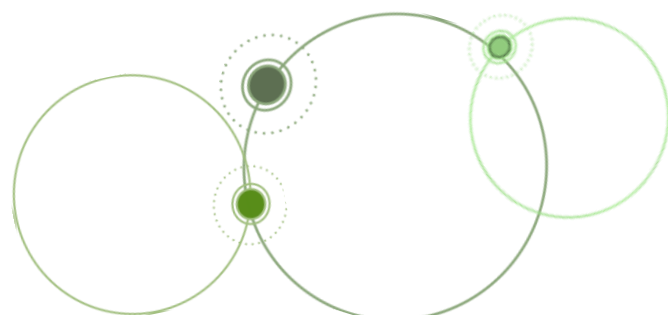
HORIZON-CL2-2022-HERITAGE-01-10: The New European Bauhaus – shaping a greener and fairer way of life in creative and inclusive societies through Architecture, Design and Arts

Expected Outcome

Projects should contribute to all of the following expected outcomes:

- **Create innovative architectural and design solutions that emphasise the use of new forms and materials in line with the European Green Deal objectives.**
- **Leverage the social function of architecture, arts and design, combining functionality and sustainability with aesthetics, arts and culture, with the aim of driving social inclusion and accessibility, as well as strengthening the contribution of culture to sustainability.**
- **Examine cultural transformations driving sustainability and explore new cooperation paths among relevant stakeholders, including cultural and creative industries, interested in designing a new European way of life in line with the New European Bauhaus.**

Scope

The New European Bauhaus (NEB) initiative was launched in the autumn 2020 by European Commission President von der Leyen to bring the European Green Deal to life in an attractive, innovative and human-centred way. It is a new cultural project for Europe to lead a whole systemic change with its own aesthetics, sustainability and inclusiveness. This is why it will become a co-creation space where architects, artists, students, engineers, designers, cultural and heritage professionals, and other population groups of society, such as for example persons with disabilities, children, young and older persons, will work together to translate the Green Deal objectives into tangible applications, inclusive and accessible experiences for citizens and stakeholders. This should be achieved by combining the three dimensions of sustainability, quality (of life, of human experiences, of architecture) and social inclusion. The NEB is essentially a project that aims to be a bridge between the world of science and technology and the world of art and culture, where citizens shall need to take ownership of the Green Deal. Its potential will depend on its capacity to leverage the power of creativity and innovation by architects, designers and artists in contemporary societies to shape a better way of living in line with the principles of environmental, social, cultural and economic sustainability, paving the way to inclusion, participation and to the creation of more resilient communities.

Multidisciplinary research and innovation involving relevant professionals, as well as citizen and stakeholder engagement, are key factors for the success of the New European Bauhaus initiative, and **should characterise proposals under this topic**. The NEB is an initiative focused on achieving societal impact, therefore **proposals should critically reflect on and elaborate practical solutions to apply its principles to the built environment, public spaces, such as green spaces and living environments that provide space and opportunities for recovery and social contacts, and cultural-artistic practices, across the many different socio-economic and cultural settings in Europe.** The role of quality architecture, as exemplified by the Architecture Guide to SDGs, should be considered by focusing on inclusive architecture and design, as a means to embrace human diversity and ensure accessibility and safety for all. NEB solutions should help to increase recognition and visibility of European artists and creators underpinning emerging talent from Creative Europe platforms.

Proposals should show how they will contribute to developing new applications and new knowledge about the design of a public and private sustainable, inclusive, functional, accessible, aesthetically attractive and resilient built environment. The interconnection between virtual and physical spaces should be taken into consideration, including with a view to the emerging concept of "hybrid environment". Research could for example deal with heritage sites and cultural landscapes, aiming to protect and enhance their values in order to improve the well-being and sense of belonging of users/residents, the accessibility for persons with specific fragilities as well as experimenting CCIs-driven innovation in living spaces. **The proposed solutions should be socially, culturally, economically and politically feasible across Europe**. Their feasibility should be verified in these terms in at least three different settings and in at least three different Member States/Associated Countries. Practical policy recommendations and guidance based on the findings should be produced for European, national, regional and local authorities. A balanced overall coverage of EU Member States/Associated Countries should be sought. Citizens and stakeholders should be involved from an early stage. Links should be envisaged with relevant European programmes and initiatives, in particular Horizon Europe, the New European Bauhaus, the European Green Deal and the UNESCO Recommendation on the Historic Urban Landscape.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	EUR 3.00 million
Topic information	Link

Call – **A sustainable future for Europe**
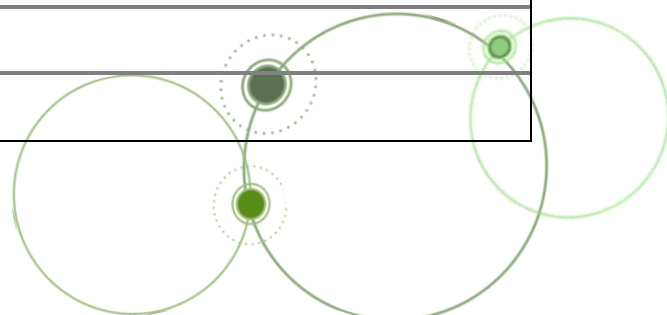
HORIZON-CL2-2022-TRANSFORMATIONS-01-01: Public policies and indicators for well-being and sustainable development

Expected Outcome

Projects should contribute to all of the following expected outcomes:

- An empirical analysis of different processes of economic growth, identifying the extent to which they are inclusive and sustainable (determinants of social, economic inclusion and environmental impacts).
- A theoretical assessment of the linkages between the standard economic growth paradigm and the dimensions of sustainable development (social, economic, health and environmental).
- Pave out possible avenues for the taking up of a novel growth framework to support inclusive and sustainable policies.
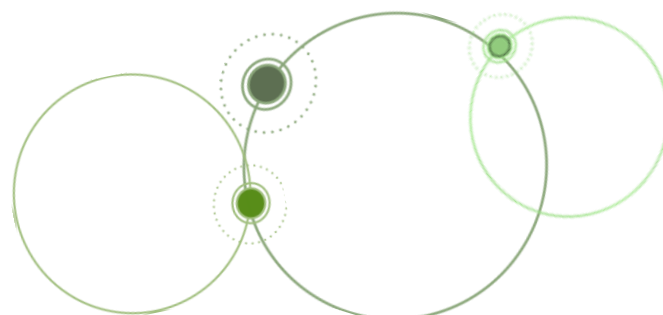
Scope

The RIA should support the transition towards a "sustainability paradigm", identifying the socio-economic inequalities and the distribution of benefits of economic growth between individuals, also taking into account the environmental impacts and limits of such growth. The action should use macro and/or micro data to identify the distributive effects of economic growth in terms of income and wealth, identifying which population groups benefitted or not and the related determinants. Proposals should cover a broad range of European countries (also the regional dimension where appropriate), as well as a sufficient number of non-European countries (e.g. from Africa, Asia, Latin America, North America) for ensuring an international comparison of the analysis, thus international cooperation is strongly encouraged. Proposals should include any potential relationship that the transition towards a "sustainability paradigm" might have with notions of environmental justice and injustice, seeking out any individuals who might be negatively impacted by the transition and ensure the inclusion of their perspectives. The analysis may take into account the impact of the COVID-19 pandemic crisis.

Research efforts should identify and propose indicators to measure well-being and sustainable development, accounting also for the measurement framework in the "beyond GDP" approaches. In particular, proposals should reconcile the new sustainable development goals (no poverty, environmental and climate hazards, societal cohesion and inclusion, good health, human well-being and gender equality) with the standard framework (productivity and consumption as the main objectives and metrics of economic growth) improving the critical understanding of the trade-offs and synergies. Project activities can also include the development of indicators for that purpose. The proposals should address the following questions: Is it possible to reconcile sustainability targets with productivity growth? How is social and economic inclusion and inequality affected? How can we drive the transition from a carbon-based linear, not sustainable economy to a carbon-free circular, sustainable well-being economy? Research may develop a platform in collaboration with relevant stakeholders to promote integrated thinking by combining financial, social and environmental returns, including disciplines as finance, economics, sustainability and environmental studies, strategic management, sociology and law.

Finally, proposals should assess possible ways to adopt such new economic development framework, identifying policy options and regulatory solutions to address the trade-offs and synergies for the transition towards a sustainable and competitive development path (i.e. competitive sustainability), ensuring economic and social inclusion for more resilient societies. International cooperation with partners from third countries, e.g. with Africa is encouraged.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – A sustainable future for Europe

HORIZON-CL2-2022-TRANSFORMATIONS-01-02: The impact of spatial mobility on European demographics, society, welfare system and labour market

<u>Expected Outcome</u>
Projects should contribute to all of the following expected outcomes:
- Analyse the demographic, economic, social and cultural effects of mobility in European countries, from a sending and receiving side.
- Envisage policies that counter brain drain and labour exploitation phenomena and enhance joint building of human capital across regions and countries.
- Identify effective policies to promote rural development and sustainability and address regional inequalities.
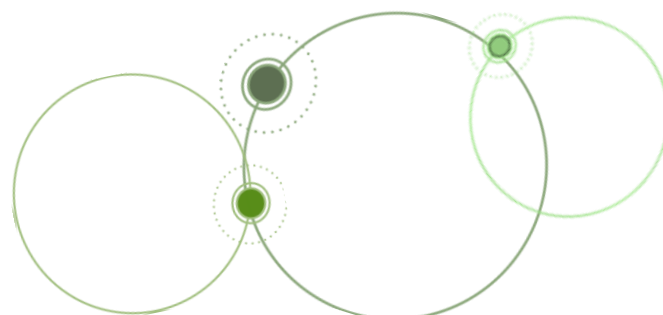
<u>Scope</u>
Proposals should analyse drivers and effects of demographically declining and left behind areas in Europe. They may develop a typology of such areas that would help in developing policies best aligned with the needs of different areas. Projects should focus in particular on spatial mobility, including, but not limited to, urban-rural, inter-regional and intra-EU mobility, and the interactions of different policies affecting these flows, as well as linkages to mobility flows of non-European migrants. **The proposals should assess, in an interdisciplinary way, the pros and cons of spatial mobility from an individual, economic, labour market and administrative perspective in both sending and receiving areas, in order to provide a new framework to understand these flows**. Different temporal forms of mobility, such as circular, chained, short term and permanent, should be addressed, as well as differences between labour, student, life style, leisure and retirement motivated mobility. Proposals should also include considerations on the circulation of workers in the EU and on the disruption caused by the COVID-19 emergency and its impact on European borders and freedom of movement.

Proposals should analyse the relation between freedom of movement within or between EU Member States and Associated Countries and the development of both sending and receiving areas, taking into account demographic and historical trends, gender, age, social and labour market characteristics. Research should focus on practices that lead to synergetic benefits for both areas concerned, going beyond a framework of mobility with winners and losers. Proposals should include a focus on the return of individuals to their place and/or country of origin, on the conditions upon which this occurs and to the benefits that this may lead to.
Proposals should also consider determinants of immobility, and study patterns, drivers and effects of mobility in conjuncture to analyses of those individuals that under the same circumstances decide not to move. Projects analysing these elements should also consider the impact of such forms of mobility for the livelihoods of individuals moving and of those who stay.

Proposals should help policymakers developing policies that contribute harnessing the positive elements of mobility and may limit the negative effects. They should do so by considering the different types of areas of origin, and catering for the different needs that these may have. Proposals should select cases from a wide variety of EU and Associated Countries, and comparative research across cases is highly encouraged.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – A sustainable future for Europe

Dedicated Topic

HORIZON-CL2-2022-TRANSFORMATIONS-01-03: Conditions of irregular migrants in Europe

Expected Outcome

Projects should contribute to all of the following expected outcomes:

- Develop new knowledge on the conditions and vulnerabilities of irregular migrants in the EU, their access to basic rights and services in the EU, their activities and their impact on the labour market.
- Enhance EU migration governance by appraising policy responses to irregular migration management and their effect.
- Propose policy measures to uphold basic rights of irregular migrants and needs of host communities.
- Provide tools and options for enhancing the protection of irregular working migrants, and identify to what extent sectors of the economy rely on their work.

Scope

Irregular arrivals to the EU have been significant in the past years, often in the context of mixed migration, including significant numbers of asylum seekers. Adding to existing populations of irregular migrants, many are not granted asylum, and as return rates also remain low, it is evident that a sizeable number of migrants remain in irregular status in the EU. This is problematic for the migrants, who are easily exploitable due to their status. This is also problematic for the host country, as irregular migrants participate in the black labour market and largely remain outside of integration pathways. In some cases, this exploitation also applies to intra EU mobile citizens.

Proposals should analyse the conditions of irregular migrants in the EU Member States and Associated Countries, and, where relevant, of intra EU mobile citizens in informal or exploitative conditions. Attention should be paid to conditions for access to basic services and rights, as well as their activities and participation in (informal) labour markets. In analysing the activities and work of irregular migrants (and where relevant of intra EU mobile citizens), proposals should also analyse the reliance of particular sectors of the economy on this irregular workforce, revealing its causes and consequences. Research should include a focus on gender issues, and may also analyse the consequences of irregularity for family members with different status in households. It should develop comparative analyses across the EU Member States and Associated Countries as regards these conditions and activities. Proposals may also include an analyses of legislative frameworks aimed to protect the rights of irregular migrants and/or sanction exploitative employers, as well as their implementation, e.g. migrants' access to protection.

Proposals may also consider the role of host communities vis-à-vis the presence and needs of irregular migrants living without access to basic rights. They should provide options for enhancing the protection of migrants and those providing assistance to them. These analyses could be enhanced by including a focus on the socio-economic effects of the COVID-19 pandemic on irregular migrants, their employers and/or those providing assistance to them.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – **A sustainable future for Europe**
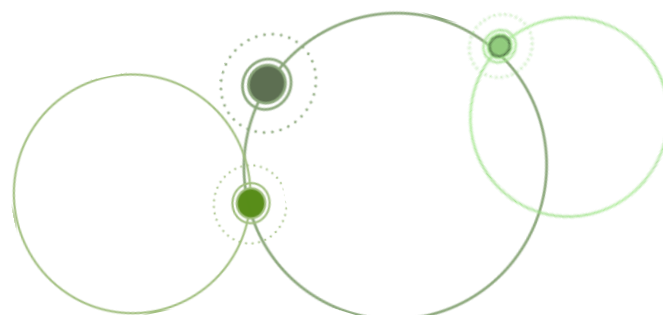
HORIZON-CL2-2022-TRANSFORMATIONS-01-04: Decision-making processes of (aspiring) migrants

<u>Expected Outcome</u>
Projects should contribute to all of the following expected outcomes:
- Enhance EU migration policy by shedding light on micro- and meso-level drivers of migration.
- Assess how far policies take into account behaviours of migrants when aiming at regulating migration.
- Show how migration decisions change along the journey, and at what stage policies are more likely to play a role in shaping migration outcomes.

<u>Scope</u>
Studies on macro-level determinants of migration have linked structural factors and a number of social processes to migration outcomes. However, there is a scarcity of research that considers the way in which meso-social and micro-individual levels interact with each other and with macro-level determinants, and play a role in shaping decisions to migrate, or not.

Proposals should develop analyses of decisions taken by individuals to stay in their place of origin (village, city, country and region) or to leave. They should therefore consider the individual micro-level of decision-making, and should also consider the timing of such decisions and the drivers of the aspiration to migrate or lack thereof. Proposals should also take into consideration individual perceptions of structural factors (e.g. socio-economic, political, climate-related) and the way in which they influence such decisions. Proposals should also combine such micro-level analyses with meso-level considerations of the context in which such decisions are formed, with due attention for differences across socio-demographic characteristics (e.g. gender, age, education level, socioeconomic status, ethnicity). Research may take stock of the available literature on the role family households play in shaping decisions to migrate, but is encouraged to go beyond, looking at societal drivers including local, regional and national politics and dynamics, events, narratives, histories and cultural and diaspora ties. Proposals should also consider how decisions to migrate are dynamic and adapt to different contexts in time and place. In such sequence of decisions, different drivers of decision-making may intervene at the different phases of the migration cycles and journeys, which proposals should consider. Consideration should be given to the role played by the availability, or lack of, legal channels for migration, when opting for an irregular alternative, and the information available on such options. Proposals may also focus, where relevant, on the role of smuggling and trafficking networks and on past experiences and traditions of return migration.

The analyses developed should shed light on the capacity of migration policies to effectively shape and/or affect migration journeys, and at what stage this occurs or may occur. Analyses should also evaluate the extent to which policies implemented consider the behaviours of migrants. Projects are strongly encouraged to develop innovative and participatory methodologies, including behavioural approaches to studies of individual decision-making. International cooperation is strongly advised, in particular with African countries.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Dedicated Topic
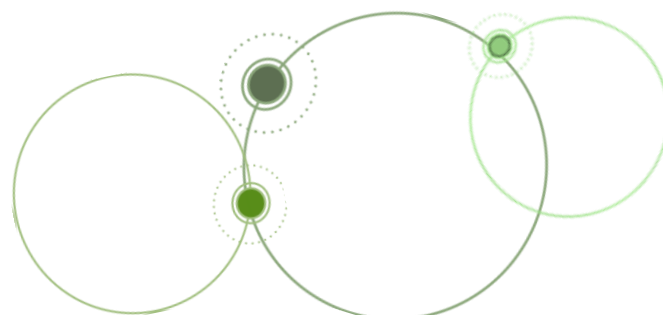
HORIZON-CL2-2022-TRANSFORMATIONS-01-05: Gender and social, economic and cultural empowerment

Expected Outcome

Projects should contribute to both of the following expected outcomes:

- Achieve a better understanding of gendered power relations across the social and economic spheres, taking into account intersections between gender and other social categories such as ethnicity, social origin, disability and sexual orientation, and the cumulative effects of multiple forms of discrimination and disadvantages. Provide evidence base about the role of education and the media in perpetuating or breaking stereotypes.
- Help reverse socio-economic and cultural inequalities and promote gender equality, thus supporting the realisation of the global 2030 Agenda's Sustainable Development Goal 5 on achieving gender equality and empowering all women and girls.

Scope

Full gender equality in the distribution and concentration of power in all political, social, cultural and economic spheres is far from being realised: in EIGE's Gender Equality Index 2020, the domain of Power scores the lowest across all six domains with an EU average of only 53.5 out of 100. Gendered power relations do not only concern decision-making and politics, but are also reflected in our everyday lives, including in the workplace, academia, arts and culture, the private and public spheres, education and early-childhood socialisation. While there has been much research on inequalities and power relations in these different areas, this has not always translated into practical, sustainable and structural change on policy and societal level. In the light of economic crises, pandemics, and the climate emergency, it is crucial to re-examine these power relations and provide innovative solutions and policy responses to advance women's empowerment.

Proposals are expected to address the following: Propose a theoretical framework to understand the formation of gendered power hierarchies leading to systematic and structural forms of discriminations, social and economic inequalities and gender-based violence. This should feed into developing solutions on how to address inequalities and underlying causes related to society's perception and construction of gender norms, masculinities, femininities and gender diverse identities. Consider how intersectionality of gender with, e.g., ethnicity, social origin, religion, disability, and sexual orientation impacts one's position and rights in society and social hierarchy, as well as one's life and career choices.

Proposals should analyse the interrelations of power and barriers to gender equality between different social and economic issues including, inter alia: policy- and decision-making, labour market participation and the gender pay gap, workplace and work-life balance arrangements, gender-based and domestic violence, reproductive rights, gender roles in education, and cultural representations, including in art and the media. Particular attention should be paid to differing cultural contexts across the EU and among Associated and third countries studied, as well as to specific contexts of economic crises, pandemics, climate change, and the 'future of work'. The action should propose concrete, practical solutions, innovative tools and policy responses to dismantle structural and systematic roots of unequal power distribution between women and men on all levels and promote women's social and economic empowerment. To achieve the expected outcomes, international cooperation is strongly encouraged, as well as the development of social innovation approaches, which can foster new social practices, social ownership or market uptake.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – A sustainable future for Europe
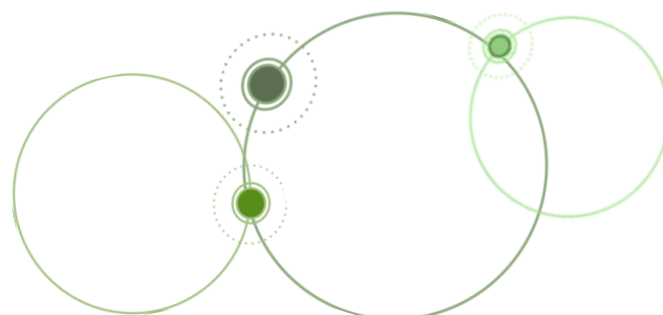
HORIZON-CL2-2022-TRANSFORMATIONS-01-06: Overcoming discrimination for an inclusive labour market

<u>Expected Outcome</u>
Projects should contribute to all of the following expected outcomes:
- Identify suitable theoretical and application-oriented concepts that foster inclusion in the labour market.
- Develop innovative policy approaches to promote inclusion, inclusiveness and quality employment of the considered groups.
- Help develop evidence-based policy responses to fight discrimination and promote inclusion and upward convergence in employment.
- Develop practices that facilitate reduction of employment gaps between vulnerable and mainstream groups, such as persons with disabilities and those without, women and men, migrants and non-migrants, people of different ethnic or racial backgrounds, etc.
- Identify and compare the usefulness of different options for policies and measures.
- Identify relevant actors to achieve effective results (institutions at different scales, civil society organizations, etc.) and explore their roles and interaction.

<u>Scope</u>
New and innovative ways of integration into the labour market of the most vulnerable groups need to be explored and tested with the objective to reduce inequalities and promote social inclusion. These vulnerable groups include people discriminated on the basis of disability and health, age, gender, language, racial or ethnic origin, sexual orientation, civil and family status and religious belonging. As an important basis for this, **suitable theoretical inclusion concepts should be identified and developed**, such as e.g. interoperable and comparative European indicators and standards. **Research should identify barriers for increasing inclusiveness in the labour market, covering elements such as disability and health, age, gender, language, racial or ethnic origin** (exploring for example factors such as accent, name or looking biases in hiring contexts), **sexual orientation, civil and family status including caring responsibilities (e.g. mothering) and religious belonging, with regard to both quantity and quality of employment**. Research activities should take a holistic approach (e.g. taking into account increasing accessibility across-the-board; availability of assistive technologies, the level of provided reasonable accommodation and supported employment for persons with disabilities; developing collective agreements tackling economic, employment and welfare inequality by gender and vulnerable group, and considering also causes originating in the education system).

Research should address the disadvantages and barriers faced, collect data on measures to improve the situation, and provide a thorough analysis of the impact and efficacy of existing policy measures, such as positive discrimination provisions and quotas. For example, in the case of people with disabilities, research should take stock of the reasonable accommodation tools and support provided across Member States and Associated Countries to compile a comprehensive catalogue. **Proposals should also include a focus on ethnic/racial discrimination at times of pandemics** such as COVID-19, and longer-term implications. Proposals may include also a focus on specific segments of labour markets, like domestic work, care work, courier and delivery services, garbage collection and commercial employees, highlighted during the COVID-19 crisis.

Research should also involve employers, including SMEs, and address their potential concerns. Civil society organisations representing those vulnerable groups, as well as trade unions should also be involved. The role of educational institutions, work integration social enterprises, the family and family associations, supporting the most vulnerable groups on their way towards inclusion in the labour market, should be considered. Where relevant, synergies and complementarities with other projects selected under this topic and under the topic on "Gender and social, economic and cultural empowerment" should be maximised. **Research is also expected to address the issue of social protection against the hazards of labour market**. For example, proposals could consider the in and out of employment and the possible compatibility with other benefits, such as disability benefits avoiding the benefit trap.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – **A sustainable future for Europe**
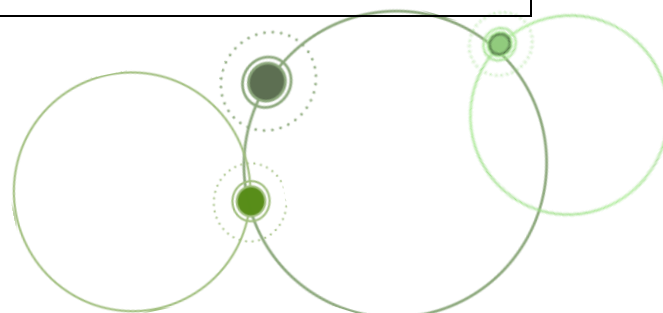
HORIZON-CL2-2022-TRANSFORMATIONS-01-07: Conditions for the successful development of skills matched to needs

Expected Outcome

Projects should contribute to both of the following expected outcomes:

- Enable policymakers to better understand, measure and reduce skills gaps and problematic mismatches between skills and jobs, thereby supporting the diffusion and adoption of innovation, the digital and green transitions, inclusive economic growth as well as individual wellbeing.
- Support the objectives of the European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience as regards Vocational Education and Training (VET) and Adult Learning (AL).

Scope

A considerable proportion of businesses in the EU report difficulties finding staff with adequate skills and consider the lack of skilled workers as one of their biggest challenge. At the same time, many young workers in the EU are classified as being overqualified and face a horizontal skills mismatch (i.e. they do not work in an occupation that corresponds to their field of study). In cases where such gaps and mismatches are not a result of individual choice, but rather the consequence of a lack of professional opportunities, of information or coordination, they may hinder the diffusion and adoption of innovation as well as reduce inclusive economic growth and individual wellbeing.

The European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience recognises the importance played by cooperation, skills intelligence, VET and AL in ensuring that people – regardless of gender, racial or ethnic origin, disability, religion or belief, age or sexual orientation, and including low-qualified/skilled adults and people with a migrant background – have the right skills to access and progress in the labour market throughout life. To reduce skill gaps, and identify and reduce problematic forms of mismatches in an informed manner, innovative research activities are needed that focus on understanding them both from the supply and demand side. Such activities should look into the roles played by individuals, public and private employers, skills-development institutions and policy frameworks.

For example, research activities carried out under this topic may cover aspects such as the determinants of the choice of VET or study programme by individuals; the coordination, cost sharing and financing instruments for skills development, looking into which instruments lead to which outcomes, and why; the role of employers and work places in the provision of VET and AL. Other researched aspects may be the involvement of employers in defining curricula and organising training; the role of personal attitudes and gender stereotypes, information and structural factors in the decision to seek initial or adult education; the extent to which training balances the provision of general, job-specific and personal development skills (e.g. the levels and gaps of digital skills in the public or private sectors). Finally, proposals may look at the opportunities of informal learning and skills formation provided by workplaces; the coordination at local level between VET institutions, employers, R&I agencies or other public institutions; the interaction of skills development systems and institutions with other domains, in particular innovation and industrial policies, etc. Where possible and relevant, research should draw lessons from recent policy interventions in a contextual manner, and propose adjustment measures, or test them through social innovation experiments.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – **A sustainable future for Europe**

Dedicated Topic
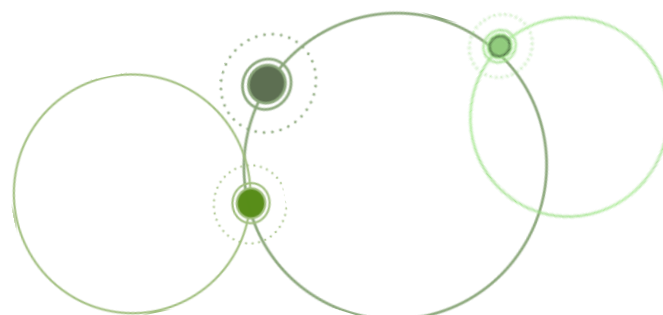
HORIZON-CL2-2022-TRANSFORMATIONS-01-08: Strengthening racial, ethnic and religious equality

<u>Expected Outcome</u>

Projects are expected to contribute to all of the following expected outcomes:

- Map, gather data and knowledge on the presence of structural forms of racism as well as episodes of hate crime and discrimination.
- Contribute to tackling inequalities by developing a knowledge and evidence base on how racism, xenophobia and discrimination are institutionalised and made structural, and impact the security, employment, education, living conditions, health and social care of people with minority and migrant background in the EU Member States and Associated Countries.
- Enhance anti-racism and anti-discrimination policies and practices by evaluating existing policy responses to employment, education, security, living and caring conditions of minority and migrant communities in the EU Member States and Associated Countries.
- Document and make visible the contributions, struggles and cultural heritage of minority communities.
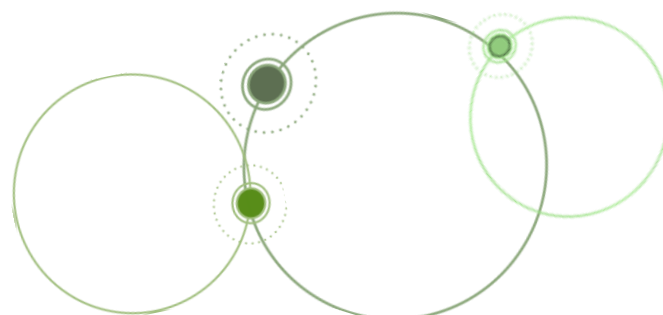
<u>Scope</u>

High levels of racism, xenophobia, as well as institutionalised or structural discrimination are linked to inequality and shape social and economic outcomes of individuals from minority backgrounds. They also have negative effects on security, quality of life and social cohesion.

Proposals should analyse the working, learning, living, environmental, health and social care conditions of people from minority or migrant descent in the EU and other countries involved in the study, with the aim of countering institutional racism in both the provision of and access to basic services as well as in access to the job market or education. They should analyse and illustrate examples of the relation between structural inequalities and structural discrimination. The analysis may include comparisons with other structurally similar groups within the same and in other countries. An analysis of existing anti-racist and anti-discrimination legislation is desirable, with a view to identifying ways in which these might be strengthened. Proposals should investigate minorities' experience of discrimination and how the latter is generated, also by comparative research. Proposals may also document their strategies, achievements and struggles and how their knowledge can enrich policy and research and improve public awareness.

Proposals should focus on various manifestations of racism and xenophobia, including one or more among anti-Black, anti-migrant, anti-Muslim, antisemitism, anti-Gypsyism. In doing so, they should take into account national specificities and intersectionality with gender/sexuality, religion, disability and other dimensions of discrimination. Proposals may also include analyses of how the COVID-19 pandemic differentially impacted such groups, aggravating already existing marginalisation.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Dedicated Topic

HORIZON-CL2-2022-TRANSFORMATIONS-01-09: Return and readmission of irregular migrants in the EU

Expected Outcome

Projects should contribute to all of the following expected outcomes:

- Support EU migration governance by assessing barriers and enablers of its return and readmission policy, and notably as regards obstacles to readmission in the countries of origin.
- Suggest avenues for international cooperation on migration between the EU, its Member States and countries of origin and transit of migrants.
- Consider alternatives to returning migrants to countries of origin and transit and evaluate human-rights related, political and financial trade-offs of these options.
- Develop recommendations based on analyses of stakeholders involved and financial and political costs associated to them.
- Develop innovative methodologies to analyse and evaluate negotiation strategies and positions of international actors on migration.
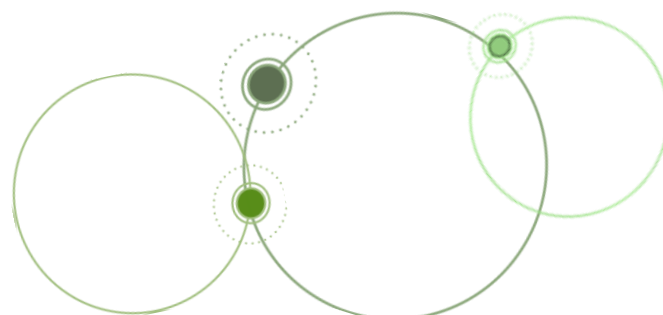
Scope

Proposals should appraise and consider the drivers and the evidence base behind the EU's return and readmission policies, and consider the outcome of this focus on return. Research should consider to what extent public attitudes to migration in Europe are susceptible to change in relation to success or failure in return and readmission policies. It should also appraise, if any and where relevant, the role played by return policies in deterring further irregular migration and their compliance to international law in doing so, and their consequence for the fundamental rights of migrants.

Proposals should consider negotiations between the EU and countries of origin and transit, and analyse the barriers and enablers to successful agreements. It may build a typology of reasons that limit the capacity and willingness of origin and transit countries to cooperate and engage in return policies. Proposals may also include considerations of different cooperation outcomes in bilateral relations compared to EU-wide relations on return. In addition, they should also analyse the role played by diaspora groups in shaping the positions of their countries of origin, as well as the role played by the local civil society in this process; primary and participatory research could be relevant in this regard. Proposals may also consider the trade-offs between remittances and readmission that countries of origin face. Proposals should therefore analyse the political construction of discourses on return in non-EU countries, and consider the way these impact on the positions of their governments. These analyses should shed light on the interdependencies between the different policy domains that are increasingly integrated in return and readmission policy, such as, but not limited to, development and trade. To this end, international cooperation is strongly advised, in particular with countries in Africa, and/or Asia, and/or the Middle East.

Proposals should consider policies implemented for those who cannot be returned, and bring forward alternatives. Proposals should also consider if and how return and readmission policies uphold the rights of migrants or contribute to the downgrading of their living conditions. In bringing forward policy suggestions, proposals should specify actors involved in their implementation and the financial and political costs associated to this. Multi-stakeholder and multi-disciplinary approaches should be favoured, to ensure all relevant perspectives are taken into account in the findings and recommendations

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Call – **A sustainable future for Europe**

HORIZON-CL2-2022-TRANSFORMATIONS-01-10: Socio-economic effects of ageing societies

Expected Outcome

Projects should contribute to all of the following expected outcomes:

- Analyse the impacts of ageing societies on productivity, society, employment (by gender, sector, occupational group and skills needed), investment, growth, healthcare systems, access to (digital) public services and public finance sustainability in the medium and long term, while maintaining service adequacy.
- Propose knowledge-based policy measures to reap the benefits of longer healthy life expectancy and explore ageing related phenomena, including (but not limited to) cultural factors, fertility, migration, family care, fight against ageism, active ageing, upskilling and reskilling policies.
- Counteract the effects of ageism and age segregation, while promoting the benefits of experience and knowledge accumulation drawing on inclusive and dialogic approaches, including through job design that is appropriate to job holders and that builds on their experience.

Scope

Proposals should analyse, with an interdisciplinary approach, the changing demographic profile of Europe, paying attention to the heterogeneous trends and developments in the different Member States and Associated countries (ideally at regional level), taking into account both the ageing of populations and the demographic consequences of migration. The project should try to assess how this change will affect consumption, production and opportunities. Projects should consider the structural changes required to adapt in the medium term to ageing societies. They should analyse intergenerational solidarity policies as a possible solution to the major challenges posed by ageing societies.

Research should analyse the impact of demographic change on skills availability and needs, assessing the risk of older aged workers to become obsolescent in a fast changing globalised, individualised, digitalised and automated environment, against the need of investing in them to lengthen working life and try to maintain high levels of productivity in the EU. Research may include consideration for the assets older workers have because of their experience, and the discrimination they may suffer in the labour market. In this context, projects should also consider how recruiting foreign labour may mitigate the shortages in sectors of the economy, and assess the sustainability of this against the needs of EU Member States and contribute to improved dependency ratios. Additional attention should also be paid to the subsequent influence that this foreign recruitment may have on labour conditions, as well as considering the age structure of migrants and the consequence this has. Projects should consider the opportunities of the 'silver economy', not only in terms of consumption of goods, services and innovations directed to the older age population, but also in terms of production. Proposals should consider potential opportunities arising from adapting jobs to an ageing workforce, making the most of the available experience. This entails considering the potential of older people for generating new economic opportunities through their work, their societal engagement (e.g. in the third and fourth sector of the economy) and the conditions by which older people are likely to want to work for longer, and the impact of this on the sustainability of the silver economy.

Together with considering such medium term dynamics, proposals may also consider the longer-term implications of ageing societies, and factors mitigating it. Research may consider gaps, opportunities and best practices regarding inclusive digital public services (including co-creating digital public services with the elderly), so ageing societies can reap the benefits of the digitalisation of the public sector. Fertility may be considered by analysing the impact of labour market policies, family policies, housing policies and conditions under which both men and women are more likely to have children. Projects may investigate whether the decline in fertility has structural causes, or if the general attitudes and willingness to have children have declined. Proposals may also look at the conditions that facilitate having the number of children desired, and investigate which measures stimulate which groups. Proposals should develop recommendations on how European societies need to cope with demographic changes in the short and medium term, with the reforms needed to ripen the economic benefits and limit the negative consequences, including in relation to societal values, also with reference to global examples. They should also consider how to do this while developing a long-term perspective aimed at increasing the EU's human capital.

Type of action	Research and Innovation action
Deadline	**20 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

Cluster 3

Civil Security for Society
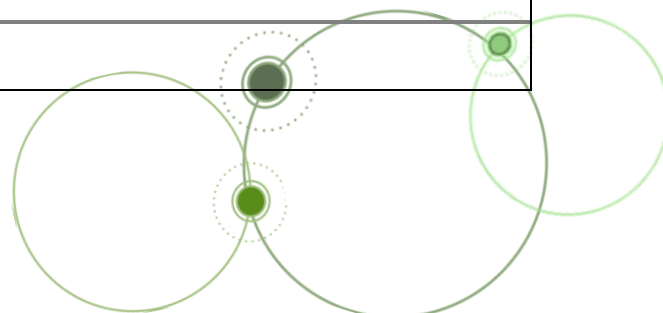
HORIZON-CL3-2021-FCT-01-03: Disinformation and fake news are combated and trust in the digital world is raised
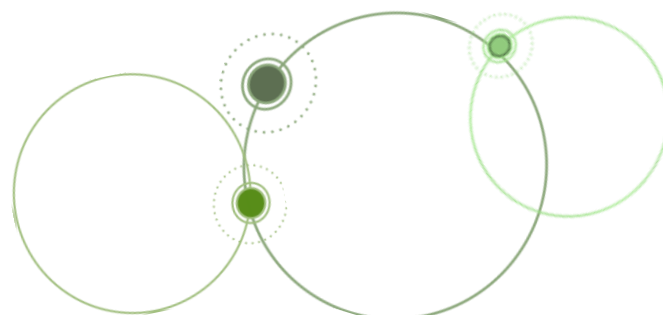
Expected Outcome

Projects' results are expected to contribute to all of the following outcomes:

- **Increased European common forensic investigation capabilities and cross-border exchanges thanks to a better understanding of main organisational cultures and of human interactions in the forensic context, and of the main causes of biases in interpretation and reasoning**;
- Strengthened bridges between different actors in an investigative process through an improved non-ambiguous communication and enhanced communication mechanisms at all levels;
- Improved European common forensics investigation capabilities and cross-border exchanges thanks to a common, modern lexicon that is used by forensic institutes and Police Authorities, validated against practitioners' needs and requirements, to facilitate their (specialised) daily work on investigating terrorism and other forms of serious crime;
- Development of safer justice outcomes through an increased understanding of how human interactions impacts on decisions at all levels of an investigative process;
- **Modern and robust methods of reasoning and of experts' decision making in forensic practice, overcoming various types of biases**;
- Forensic institutes and Police Authorities active in crime scene investigations benefit from innovation education and training curricula.

Scope

Combating disinformation and fake news with implications for security is an important aspect where modern information analysis is needed. Bots are increasingly used to manipulate the public opinion and spread fake news on the internet. Causing a mass panic by spreading fake news is one example. Dimensions of this problem increase even more in crisis situations, such as the COVID-19 lockdown, where spreading disinformation and fake news, by infusing uncertainty and fear, aims at harming people's life, intensifying the crisis situations, weakening the European societies and aggravating the divisions. **This topic asks for an interdisciplinary approach based both on societal capabilities to withstand such a threat (e.g., education on trustable sources of information, research on the impact of uncertainties caused by disinformation on public crisis management and society overall) and on technological means of fighting against it.** Regarding the latter, for a more effective early detection of criminal activities, **Police Authorities and (social) media organisations need tools and (forensic) capabilities that, e.g., enable the assessment of the origin, veracity and trustworthiness of digital content by identifying altered or fake generated information.** In the European context, this also implies that the tools should have various functionalities such as: identification of non-human originated content via origin and activity, detection of machine generated text in various languages, verification of the authenticity of data with a high accuracy (better than human), fast analysis of large amounts of data to pre-filter for faked and/or manipulated content, which can be presented to investigators, etc. Activities proposed within this topic should build on results of previous projects on disinformation and fake news, such as those funded under Information and Communication Technologies Calls of Horizon 2020, **and should address both technological and societal dimensions of fighting against disinformation and fake news in a balanced way, including also knowledge about cultural aspects and perception of disinformation (as well as trustworthiness of sources) among citizens. Thus, this topic requires the effective contribution of Social Science and Humanities (SSH) disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities**. Coordination with successful proposals from topics HORIZON-CL2-DEMOCRACY-2021- 01-08 (Politics and governance in a post-pandemic world), HORIZON-CL2-DEMOCRACY2022-01-06 (Politics and the impact of online social networks and new media) and HORIZON-CL4-2021-HUMAN-01-27 (AI to fight disinformation) should be envisaged so as to avoid duplication and to exploit complementarities as well as opportunities for increased impact. In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content should be addressed only if the consortium deems it relevant in relation to the objectives of the research effort.

Type of action	Innovation action
Deadline	**23 November 2021**
Expected EU contribution per project	EUR 4.00 million
Topic information	Link

HORIZON-CL3-2021-FCT-01-06: Domestic and sexual violence are prevented and Combated

Expected Outcome

Projects' results are expected to contribute to some or all of the following outcomes:

- Improved prevention, detection and investigation of domestic violence and sexual assaults, including collection of court-proof crime evidence, which take into account European multicultural dimension, legal and ethical rules of operation, as well as fundamental rights such as privacy, protection of personal data and anonymity of victims;
- Enriched European common approaches applied by Police Authorities to fight domestic and sexual violence relying on the synergy of technology, the latest socio-psychological knowledge learned from cases and the field experience of Police Authorities and entities dealing with victims;
- Novel, safe, lawful and efficient solutions applied by security practitioners and policymakers to protect victims of domestic or sexual violence, along with a proper assessment methodology to validate the approach;
- Increased awareness of citizens regarding domestic and sexual violence;
- Improved support in shaping and tuning of regulation on domestic violence and on sexual violence by security policy-makers, which also includes GDPR-compliant IT tools in the procedures;
- Increased use, by victims, of automated, interactive tools (e.g., chatbots) to report cases of domestic abuse and/or sexual violence to the police;
- Improved skills, tools and training curricula for Police Authorities and Civil Society Organisations to prevent and combat domestic and sexual violence;
- Identification and development of new concepts, innovative approaches and pioneering practices pertaining to alternatives to imprisonment for offenders to reduce recidivism and, therefore, support the fight against crime.

Scope

Domestic violence keeps on being a persistent crime throughout Europe. However, the ratio of cases that are effectively reported to Police Authorities is very low. One of the causes of this lack of reporting is the limited protection offered to victims, fear, reluctance of neighbours to intervene by informing the Police Authorities, lack of awareness whom to turn to, which mechanisms exist, etc. In addition to domestic violence, women are also exposed to the threat of sexual abuse and aggression in many situations off-home. Moreover, the increase of cases of multiple abuse by groups of offenders that record their crimes using mobile devices and then share them by phone or online is a growing concern with a high social impact. Furthermore, rates of domestic and sexual violence rise when societies are under stress, during, e.g., food shortages, economic crisis, natural disasters, and epidemics. The COVID-19 lockdown showed that in such a crisis situation the problem of domestic violence gets even more emphasised, both because victims are trapped in their homes with violent partners who are even more stressed than usually, and because the ability of services to help becomes even more limited. Similarly, women who are displaced, refugees, and living in affected areas are particularly vulnerable and exposed to sexual violence; the closure of establishments offering legal sex work because of e.g., epidemics, brings further dangers.

Needs from innovation, to be performed in a lawful and ethical manner while protecting fundamental rights, such as privacy and protection of personal data, are as follows. Firstly, building on the previous works (such as the H2020 project IMPRODOVA23 or projects funded under the Rights, Equality and Citizenship Programme24), there is a need to improve current European approaches to fight domestic and sexual violence (prevent, locate, report and collect evidence) using innovative technological solutions, such as by enriching existing risk analysis tools with real-time data obtained through technological means, that will reduce both the amount of human resources to be committed and the response time. Furthermore, victims of domestic abuse as well as of sexual violence are often reluctant to contact the police personnel and prefer to speak to chatbots, one of the main reasons being the fear of being judged. Thus, there is a clear need for innovation regarding further developments and improvements of automated, interactive tools such as chatbots that would help and stimulate victims to report cases of domestic abuse and/or sexual violence to the police. In addition, specifically related to the cases of multiple abuse by groups of offenders that share their crimes through mobile devices or via social media, activities are needed to develop innovative technological solutions aimed at finding the source of these videos, identifying offenders, and finding victims. **Moreover, modern and effective awareness raising campaigns need to be developed for Police Authorities and relevant Civil Society Organisations to pass key messages to potential victims, as well as wide communities, while taking into account European multicultural dimension.** Last but not the least, modern and novel approaches are needed to support victim assistance services of Police Authorities and relevant Civil Society Organisations in providing efficient protection and help to victims. As both technological and societal developments are expected, **the consortia should consist in IT specialists, Police Authorities, relevant Civil Society Organisations, sociologists, social workers and psychologists. If possible, taking into account their right to anonymity, their dignity and rights, victims could be involved as well, through relevant Civil Society Organisations that have the safeguards in place to protect them.** Evolutions in domestic and sexual violence, such as their increase during any type of emergency, e.g., epidemics, should be taken into account too. Methods for evaluating proposed solutions should be developed as well. All developed solutions should be accompanied by corresponding training curricula for Police Authorities and relevant Civil Society Organisations.

Proposals are expected to address one of the following options:

Option A: Domestic violence
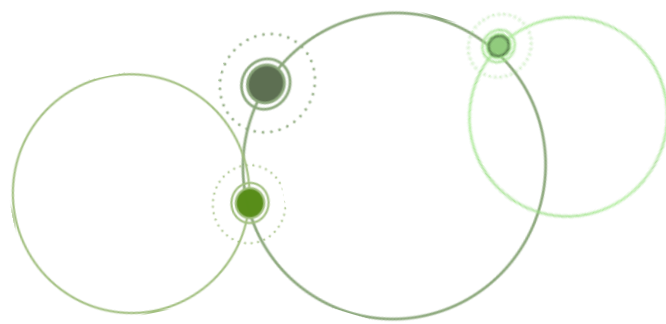
Option B: Sexual violence

Coordination of the successful proposals from the two options is encouraged so as to avoid duplication and to exploit complementarities as well as opportunities for increased impact. Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake. **This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.** The testing and/or piloting of the tools and solutions developed in a real setting with one or more Police Authorities and other relevant authorities is an asset; regardless, applicants should plan to facilitate the uptake, replication across setting and up-scaling of the capabilities - i.e. solutions, tools, processes et al. – to be developed by the project.

Type of action	Innovation actions
Deadline	**23 November 2021**
Expected EU contribution per project	EUR 3.00 million
Topic information	Link
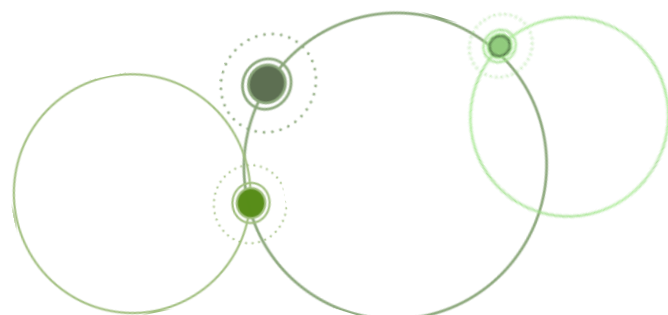
HORIZON-CL3-2021-FCT-01-07: Improved preparedness on attacks to public spaces

<u>Expected Outcomes</u>

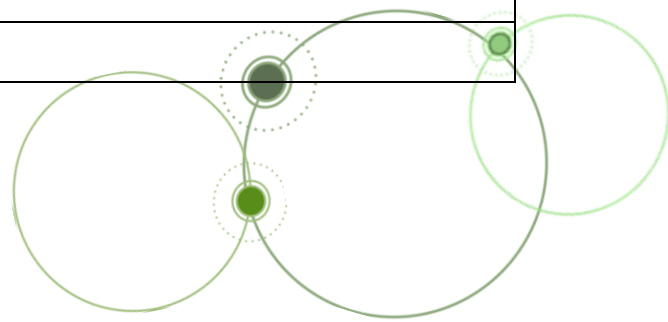Projects' results are expected to contribute to all of the following outcomes:

- Improved vulnerability assessments by law enforcement and local managers of public spaces with a specific focus on countering and/ or preventing terrorist attacks or other forms of severe violence (amok, mass-riots), including attacks with explosives, improvised weapons and vehicles;
- Better identification of specific vulnerabilities and elaboration of mitigation strategies by security practitioners and policy-makers due to the possibility to simulate attackscenarios in any public space in realistic conditions and to test and train different prevention and response measures;
- Improved training of Police Authorities in collaboration with different public and private actors (e. g., crisis management and civil protection authorities, fire brigades, regulatory agencies, emergency health services, security managers, private security organisations, civil society groups etc.) to enhance their preparedness to attacks on public spaces;
- Enhanced planning capabilities of security practitioners and policy-makers due to the identification of potential vulnerabilities connected to the design/refurbishment and construction/improvement of different public spaces and measures to reduce them by implementing a comprehensive security-by-design approach in urban planning (also including aspects of social inclusion);
- Enhanced modelling capabilities of security practitioners, policy-makers and research institutions due to the identification of potential vulnerabilities connected to the different public spaces, analysis of crowd behaviour and possible emergence of various threats to security in order to minimise possible threats and vulnerabilities and supporting planning of respective resources and activities.

<u>Scope</u>

Public spaces such as squares, sport venues, shopping districts, places of worship or touristic attractions have been the target of numerous terrorist and other violent attacks causing significant loss of lives and causing societal insecurity as well as economic losses. The means to carry out such attacks from one or several attackers range from sophisticated and well-planned scenarios including several attackers using explosives and firearms, up to so called low-cost attacks making use of everyday goods such as cars, axes and kitchen knives. Such attacks have proven to be very difficult to prevent and quick-reaction and preparedness to respond are the crucial elements in reducing their impact. The EU and its Member States have reacted to this challenge in the framework of the Action plan to support the protection of public spaces and the respective staff working document "Good practices to support the protection of public spaces" . Vulnerability Assessments (VA) are an established tool for example in the area of the protection of critical infrastructures. Their aim is to identify the inherent vulnerabilities of a specific target and thus to be able to put in place appropriate mitigation measures. Such assessments are used in public spaces already by Police Authorities in case of large-scale events, official visits or as part of forward-looking city planning activities. The impact on the quality and openness of public spaces should however be minimised as much as possible**.**

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. The full involvement of citizens and civil society organisations is crucial to achieve solutions that meet the requirement of having a balanced approach between security and openness of public spaces. Fundamental rights (including privacy) aspects should also be taken into account. What is missing so far is a capability for security managers (public security authorities and/or private security organisations) and local authorities to conduct VA with the help of most advanced technological means. Tools for large-scale urban VA should be able to simulate realistic scenarios in any public space of different urban areas and give the users the possibility to test different prevention and response measures. They should further give the possibility for cooperation of the main public and private actors (e. g., crisis management and civil protection authorities, fire brigades, regulatory agencies, emergency health services, private security managers, etc.), and the development of tailor-made trainings. Continuing updates of the tools with the data of new urban areas, new modes of attacks and different scenarios would ensure that such capability is of long-term use and able to adapt to new developments. For that reason, it is encouraged to use the expertise and the community of the Joint Research Centre to disseminate the developed VA solutions to the stakeholders and to adapt it for long-term use. The Joint Research Centre might also support with its simulation capabilities concerning blast and vehicle ramming. At the same time, such platforms could provide support in planning processes of public spaces in case of new constructions, or redesign in order to avoid creating vulnerabilities and supporting a security-by-design approach27, similar to what exist already for safety. Responsible Research and Innovation28 could be a relevant approach for the involvement of diverse stakeholders, launching debates, and co-developing or even implementing solutions. In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content should be addressed only if the consortium deems it relevant in relation to the objectives of the research effort.

Type of action	Research and Innovation Action
Deadline	**23 November 2021**
Expected EU contribution per project	EUR 3.00 million

Topic information	Link

HORIZON-CL3-2021-FCT-01-08: Fight against trafficking in cultural goods

Expected Outcomes

Projects' results are expected to contribute to some or all of the following outcomes:

- Robust research methodologies, improved intelligence picture and understanding of mechanisms behind organised crime activities related to trafficking of cultural goods both offline and online, modus operandi, possible nexus with terrorist financing;
- Enhanced ability of security practitioners to identify organised crime networks involved in trafficking in cultural goods and to detect their illicit business models, including financial aspects and money laundering activities in this sector;
- Enhanced ability of security practitioners to detect and prevent the emergence of organised crime networks involved in trafficking in cultural goods, and to respond to the threat of existing organisations;
- Improved and validated tools, skills and training materials (including the lawful court proof collection of crime evidence) for European Police Authorities, Border Guards and Customs Authorities to tackle criminal activities related to trafficking of cultural goods;
- Improved cooperation between European Police Authorities, Border Guards and Customs Authorities, as well as with specialised researchers and international actors, in tackling this form of crime;
- Improved databases on stolen/trafficked cultural goods;
- **Improved evidence-based policy-making against trafficking in cultural goods.**

Scope

Trafficking in cultural goods has become one of the most profitable criminal activities for organised crime groups and the booming art and antiquity market is creating new business models for organised crime. At the same time, the art and antiquity market is also one of the least regulated markets in Europe, characterised by a lack of traceability and speculative pricing of the objects, rendering it an ideal place also for money laundering, tax evasion, etc. Building on the results of recently completed projects, the nexus between terrorism and serious and organised crime (including cyber) deserves to be analysed further. The involvement in serious and organised crime may as well allow terrorists to generate funds to finance terrorism-related activities, as it is the case in trafficking of cultural goods. "Blood antiquities" are, unfortunately, nothing new. Works of art and archaeological goods/finds are looted in war zones as well as in regions not experiencing conflict, and then sold to wealthy collectors and antiquities dealers in Europe. Research has shown that crimes related to cultural goods may be conducted by organised crime groups in order to generate profit or to launder illegally acquired funds. Despite the seriousness of this issue, fundamental questions remain: How are these precious items secretly transported and what facilitates their illicit movement? What are the relations with other types of crime? How much does the trafficking of cultural goods bring in? What is the role and extension of online markets and social networks in supporting trafficking (e.g., discussion groups where looters and intermediaries exchange tips and tricks to circumvent police checks)? How can a stolen work be identified? How should the information be stored in accessible databases? What are reliable and ethical ways to gather and share information about this type of crime? What is the relationship between organised crime and the open market for cultural goods (the "grey" market)? What roles do museums and other cultural institutions (unwittingly) play in this trade? And - who defines what is an antiquity and to whom it should belong? Evidence-based research is needed to answer these questions, and to support the development of targeted and effective anti trafficking policy. The proposals in this topic should shed a light on these issues through robust research methodologies that prioritise new data collection and analysis, and applications towards the development of evidence-based policy. Proposals should support the gathering of intelligence and the development of tools that Police Authorities and other relevant practitioners need to fight this crime and to collect actionable (cross-border) evidence acceptable in court, with the ultimate goal of disrupting the illicit trade and of mitigating its harmful effects in Europe and beyond.

Activities proposed within this topic should address the issue from various angles, combining both social research with technological development and applications in a logical manner. Therefore, this topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. Proposals should also include research into the international dimensions of the trafficking of cultural goods, as well an as investigation of the possible connections between this and other forms of crime. Due to the specific scope of this topic, in order to achieve the expected outcomes, international cooperation is encouraged. Police Authorities, Border Guards Authorities and Customs Authorities should be involved in the consortia, in order to tackle effectively all aspects of this crime.

Coordination with successful proposals under topic HORIZON-CL3-2021-FCT-01-09, HORIZON-CL3-2021-FCT-01-10, HORIZON-CL3-2022-FCT-01-05, HORIZON-CL3- 2022-FCT-01-06 and HORIZON-CL3-2022-FCT-01-07 as well as with successful proposals under topic HORIZON-CL2-HERITAGE-2021-01-08 (Preserving and enhancing cultural heritage with advanced digital technologies) should be envisaged so as to avoid duplication and to exploit complementarities as well as opportunities for increased impact. Proposed research that could also link with security research for border management (for example, border checks) would be an asset. If relevant, the proposed activities should attempt to complement the objectives and activities of the EU Policy Cycle
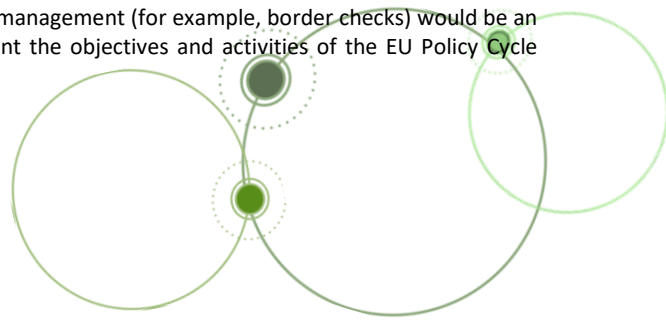
(EMPACT) – Priority Organised Property Crime. If applicable and relevant, coordination with related activities in the Digital Europe Programme should be exploited too. In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Type of action	Research and Innovation action
Deadline	**23 November 2021**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

HORIZON-CL3-2021-FCT-01-11: Prevention of child sexual exploitation

Expected Outcome

Projects' results are expected to contribute to some or all of the following outcomes:
- Increased understanding of security practitioners and policy-makers of the prevalence and of the process leading to child sexual abuse and child sexual exploitation;
- Enhanced understanding of the characteristics and key differences between offending and non-offending Minor Attracted Persons;
- Innovative and effective solutions, including training curricula, are validated and adopted by European Police Authorities and relevant Civil Society Organisations to prevent, detect and effectively act on child sexual exploitation, both offline and online, by providing necessary assistance to potential offenders, as well as by providing adequate preventative campaigns to reach vulnerable groups;
- Developed cross-culturally validated risk assessment tools for child sexual offenders; Enhanced perception by the citizens that Europe is an area of freedom, justice and security thanks to increased security of children;
- Improved cooperation between European Police Authorities and relevant Civil Society Organisations in preventing this form of crime, taking into account fundamental rights;
- Improved evidence-based policy-making related to the prevention of child sexual exploitation.

Scope

Child Sexual Exploitation (CSE), including the increasing amount of child sexual abuse material (CSAM) detected online as well as the online solicitation of children for sexual purposes, remains a serious threat. During the first wave of the global pandemic of COVID-19, there was an increased online activity in dedicated forums by offenders exploiting opportunities to engage with children who were more vulnerable due to isolation, greater online exposure and less supervision. This further highlighted the importance of CSE prevention, early detection and effective actions, both online and offline. Research is needed to better understand the process leading to offending in all its various forms (e.g. from watching CSAM to sexually abusing a child), i.e. what triggers the behaviour of potential offenders, which approaches in addressing their behaviour work and which not, which profiles of offenders can be generated, etc. Research is also needed to provide a deeper understanding of the prevalence of these crimes as well as the prevalence of persons with a sexual interest in children. Early or weak signals should be further researched in combination with effective countermeasures and interventions. **The solutions should be accompanied by corresponding training curricula for Police Authorities and Civil Society Organisations when necessary (e.g. when they involve providing assistance to potential offenders or victims). Methods for evaluating proposed solutions should be developed as well. Special care needs to be given to ethics and fundamental rights protection throughout the research and the solutions proposed.** The evolving character of the CSE modus operandi should be taken into account in all activities proposed under this topic. **The societal dimension should be in the core of proposed activities. In addition to the mandatory involvement of Police Authorities, the involvement of other relevant practitioners in the consortia - e.g. from Civil Society Organisations, health professionals (psychologists, psychiatrics…), forensic psychologists, criminologists and sociologists - is strongly encouraged as well.** As such, **this topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities**. The testing and/or piloting of the tools and solutions developed in a real setting with one or more Police Authorities and other relevant authorities is an asset; regardless, actions should foresee how they will facilitate the uptake, replication across setting and up-scaling of the capabilities - i.e. solutions, tools, processes et al. – to be developed by the project.

Type of action	Research and Innovation Actions
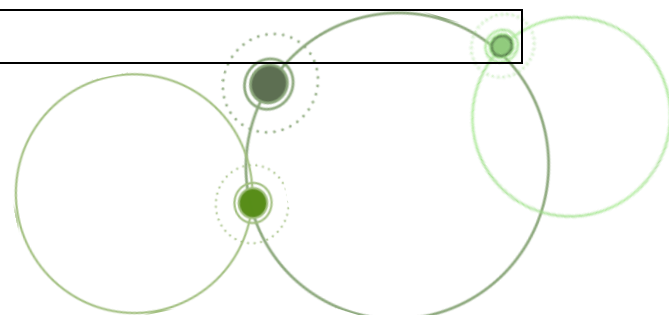
Call – Fighting Crime and Terrorism 2021

Deadline	23 November 2021
Expected EU contribution per project	EUR 3.00 million
Topic information	Link
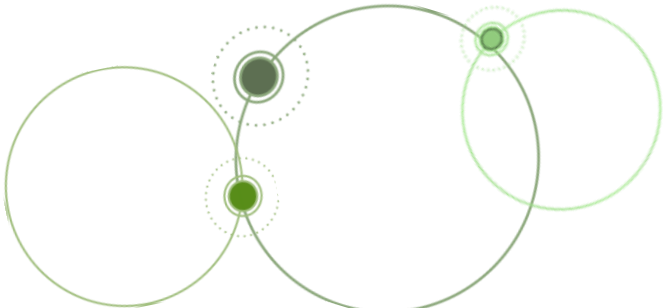
HORIZON-CL3-2021-FCT-01-12: Online identity theft is countered
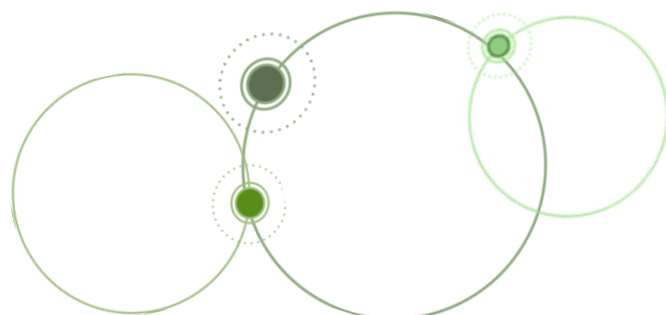
Expected Outcome:

Projects' results are expected to contribute to some or all of the following outcomes:

- European Police Authorities are provided with modern, innovative and validated tools and training curricula, which take into account legal and ethical rules of operation as well as fundamental rights such as privacy and protection of personal data to prevent, detect and investigate online identity theft, and lawfully collect crime evidence across borders for its use in court proceedings;
- Strengthened ability of security practitioners to identify (new forms of) online identity theft at an early stage thanks to improved knowledge on the modus operandi and new trends in identity theft, including but not limited to deepfakes, and innovative solutions for Police Authorities to tackle them in lawful manner;
- Improved understanding on the societal aspects and impacts of identity theft, as well as on the key challenges related to it;
- Enhanced perception by the citizens that Europe is an area of freedom, justice and security thanks to innovative awareness-raising campaigns explaining to citizens the key and evolving mechanisms of identity theft and how to protect against them;
- Improved shaping and implementation of regulation related to the fight against identity theft by security policy-makers.

Scope

The "classical" form of identity theft has been a big business for years and consists in personal and financial data stolen online, sold in the underground economy and misused by criminal organisations all over the world, usually for financial gain. With the technological evolution, identity theft evolves as well. Personal details can be found by hacking computers, but identity thieves are increasingly getting citizens' personal information from social media sites. Furthermore, an on-going improvement of technologies to create deepfake audio and video material may result in novel forms of identity theft. This relatively new but rapidly evolving technology superimposes audio, images or videos over another video or creates new ones. For instance, it can be used, among others, to generate new "personalised" child abuse material, to create fake social media accounts in the name of the target person (to harness or stalk them), to place the faces of celebrities on existing pornographic videos, to spread misinformation about a company (leading to financial losses) or a politician or an expert (reputational damage). Research is needed to develop new technological means of detecting deepfakes in support of the work of Police Authorities, as it may only be a matter of time before deepfakes are used more often in online identity theft cases. In addition, this can have serious implications for Police Authorities, since it might complicate investigations and raise questions about the authenticity of evidence. The issue of collecting (cross-border) evidence for its use in courts of law, i.e. in a lawful manner and respecting fundamental rights such as privacy and protection of personal data, should be tackled in proposed activities as well. Other evolving modus operandi and new trends in online identity thefts should be analysed too, and corresponding innovative lawful societal means of preventing as well as innovative lawful technological means of detecting and investigating them should be developed. Thus, activities proposed within this topic should address both the technological and societal dimensions of online identity theft in a balanced way. An analysis of trends (who the victims of identity thefts are usually, whether gender/age/ICT skills play a role, etc.) would be an asset. **Special care should be given to ethics and fundamental rights protection throughout the research and the solutions proposed. This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. With the aim of developing effective awareness raising campaigns, involvement of relevant Civil Society Organisations, sociologists and psychologists who can shed a light on the phenomenon of identity theft from the side of victims and how to support them, would be an added value of proposals submitted under this topic.** If applicable and relevant, coordination with related activities in the Digital Europe Programme should be envisaged too.

Type of action	Research and Innovation action
Deadline	**23 November 2021**
Expected EU contribution per project	EUR 3.00 million
Topic information	Link

Call – Fighting Crime and Terrorism 2022

HORIZON-CL3-2022-FCT-01-02: Better understanding the influence of organisational cultures and human interactions in the forensic context as well as a common lexicon
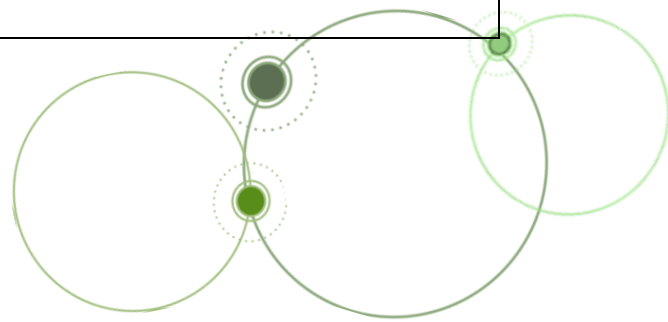
Expected Outcomes

Projects' results are expected to contribute to all of the following outcomes:

- Increased European common forensic investigation capabilities and cross-border exchanges thanks to a better understanding of main organisational cultures and of human interactions in the forensic context, and of the main causes of biases in interpretation and reasoning;
- Strengthened bridges between different actors in an investigative process through an improved non-ambiguous communication and enhanced communication mechanisms at all levels;
- Improved European common forensics investigation capabilities and cross-border exchanges thanks to a common, modern lexicon that is used by forensic institutes and Police Authorities, validated against practitioners' needs and requirements, to facilitate their (specialised) daily work on investigating terrorism and other forms of serious crime;
- Development of safer justice outcomes through an increased understanding of how human interactions impacts on decisions at all levels of an investigative process;
- Modern and robust methods of reasoning and of experts' decision making in forensic practice, overcoming various types of biases;
- Forensic institutes and Police Authorities active in crime scene investigations benefit from innovation education and training curricula.

Scope

Security research projects related to forensics typically focus only on technologies and data, while the process by which forensic experts evaluate and interpret the evidence is often put aside. However, **cognitive methods and human judgement play a significant role as forensic experts observe and interpret the data.** By doing this, forensic experts are almost inevitably exposed to irrelevant contextual information (such as suspect's criminal record or ethnicity, a type of the information that can be obtained due to a liaison between a forensic expert and investigators, police and the prosecution), which can potentially cause bias. In contexts where digital technologies are involved in creating forensic outcomes, biases and loss of transparency can also arise from different roles and disciplinary backgrounds of the different actors working on and with the digital tools. Communication between practitioners within the same institute can introduce a bias as well. When exchanging the information cross-border, both organisational cultures and languages can also cause a bias. Understanding how human interaction, both internally and in the European context, impacts on decisions at all levels of an investigative process is critical for the development of safe justice outcomes. In forensic practice, it is crucial to understand the impacts of various types of biases on interpretation and reasoning, and to develop methods to increase the robustness of reasoning and of experts' decision making. Research is needed to evaluate, develop and enhance methods and cognitive techniques to communicate non-ambiguously in the forensic and legal context, as well as to develop, improve and enhance communication mechanisms between the actors of the criminal justice chain. That being said, in the European context, a critical enabler for an improved collaboration and communication between forensic practitioners is the use of a clear, consistent vocabulary. Such a shared vocabulary would, among others, allow for a common understanding of forensics, improve structured (cross-border) data sharing, and amplify the (cross-border) acceptance of evidence in court. There is hence a need for a development of a common lexicon, able to adapt to the evolving aspect of forensic technologies. **This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.** Coordination with successful proposals under topic HORIZON-CL3-2022-FCT-01-04 and HORIZON-CL3-2022-FCT-01-01 (on common data formats) should be envisaged so as to avoid duplication and to exploit complementarities as well as opportunities for increased impact. Where relevant, coordination should also be foreseen with actions and results of projects under Justice Programme (2014-2020). Operational examples should also be considered, where relevant in line with activities of the SIRIUS Project . In addition, cooperation with the European Network of Forensic Science Institutes (ENFSI) would be welcome.

Type of action	Research and Innovation action
Deadline	**23 November 2022**
Expected EU contribution per project	EUR 3.00 million
Topic information	Link

HORIZON-CL3-2022-FCT-01-03: Enhanced fight against the abuse of online gaming culture by extremists

Expected Outcomes

Projects' results are expected to contribute to some or all of the following outcomes:

- Enhanced knowledge on the use of online gaming culture and structure by violent extremists as well as their modus operandi through video game chatrooms, used as their recruitment tools;
- European Police Authorities benefit from better, innovative and validated tools and training curricula (which take into account legal and ethical rules of operation, as well as fundamental rights such as privacy and protection of personal data) to tackle violent radicalisation through online gaming culture;
- Increased awareness of citizens about online radicalisation through gaming culture;
- Enhanced protection of youth in the gaming environment against recruitment into violent radicalisation;
- Improved shared understanding and cooperation between different actors involved, including security practitioners, gaming industry, social media, video game hosting services and civil society;
- Improved shaping and tuning by security policy-makers of regulation on preventing abuse of online gaming culture by violent extremists.

Scope

A highly increasingly influencing societal issue related to radicalisation is the online gaming culture. Earlier studies have shown no link between video games and violence. However, terrorism and gaming experts claim that forums and chatrooms are used as recruitment tools. Research is needed to analyse the use of online gaming culture and structure by violent extremists as well as their modus operandi through video game chatrooms and forums. Regarding video games themselves, an in-depth analysis is needed on how the type of the video game, of its theme, design, aesthetics etc. plays a role in the choice of the chatroom to be used as a recruitment area. As far as video game chatrooms, including social media platforms discussing video games, are concerned, dissemination strategies of violent extremists through them as well as their ways of grooming should be analysed. Based on the results of these analyses, innovative (societal) means of fighting this type of crime, both online and offline, should be developed. The role of Police Authorities in this respect should be analysed. Possibilities of detecting and investigating this type of crime should be discussed as well, with a focus on legal and ethical aspects. **Modern and effective awareness raising campaigns should be developed, that would target young people, parents, school teachers, video-gaming industry and wide communities, and that take into account the European multicultural dimension.** Methods for evaluating proposed solutions should be developed as well. Suggestions to gaming industry on which traps to avoid when designing and upgrading a video game should be provided too.

Proposed activities should take into account the evolving nature of this type of crime and of technology, and be performed while respecting the applicable legislation and fundamental rights, such as privacy and protection of personal data. **Societal dimension should be in the core of proposed activities, with a support of technologies. The consortia should consist in Police Authorities, representatives of gaming industry, gaming experts, IT specialists, (cyber) psychologists and sociologists. This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake. Participation of relevant Civil Society Organisations or gaming communities would be an added value.** Analysis of the possible applications of research results to other similar problems (e.g. child sexual abuse) is welcome. Coordination with successful proposals under topic HORIZON-CL2-DEMOCRACY-2022- 01-04 (Evolution of political extremism and its influence on contemporary social and political dialogue) should be envisaged so as to avoid duplication and to exploit complementarities as well as opportunities for increased impact.

Type of action	Research and Innovation Actions
Deadline	**23 November 2022**
Expected EU contribution per project	EUR 3.00 million
Topic information	Link
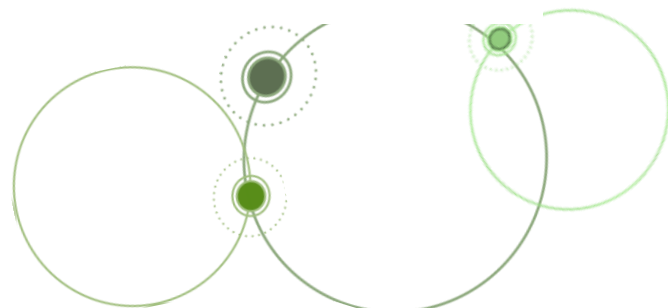
HORIZON-CL3-2022-FCT-01-04: Public spaces are protected while respecting privacy and avoiding mass surveillance

Expected Outcomes
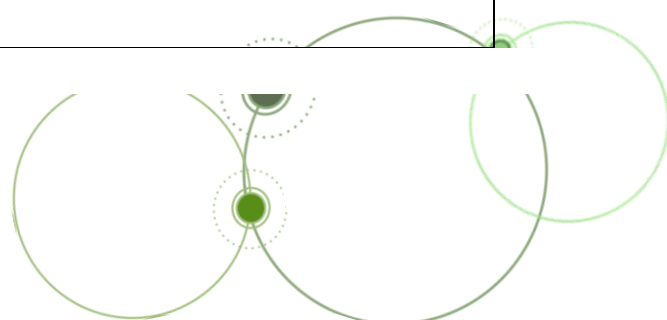Projects' results are expected to contribute to all of the following outcomes:
- **Improved understanding by local authorities, operators and policy makers of the effect of large-scale surveillance of public spaces on the behaviour of citizens and possible negative effects on local communities;**
- Enhanced transparency for citizens on different forms of surveillance by Police Authorities 46 , local authorities and private actors in public spaces, and increased awareness of applicable rights towards operators of such systems;
- Improved protection of public spaces without the need for 24/7 data collection and storage;
- Set of common standards and good practices by local authorities, operators and policy makers for internal access restriction, anonymization and data minimization allowing a proportionate use of already installed surveillance-systems (such as CCTV) in public spaces, reducing the risk of misuse of collected data and respecting fundamental rights, especially the protection of personal data.

Scope
In recent years, the number of different tools for the surveillance of public spaces has been growing at massive pace in most European cities. CCTV-systems in public spaces are the most evident examples. They have been expanded in terms of quantity (number of CCTV in public spaces, such as squares, streets or touristic sites), quality (improved solution of images, possibility of tracking and automatic pattern-recognition) and also scope (CCTV present in areas like parks, 24/7 recording as standard due to higher data storage capacities). CCTV-systems are the most evident and visible, although by far not the only ones. Acoustic sensors, Automatic Number Plate Recognition (ANPR) and in the future possibly widespread facial recognition add to a system of sensors that cover large parts of public spaces in many European cities. While evidence suggests that such tools can help to combat certain forms of crime an increase the perceived security of citizens, the significant expansion of areas that are monitored risks to create negative effects for the right for privacy. Scientific studies indicate that also legal forms of behaviour are adapted by persons, which are aware that they are monitored by surveillance systems. Furthermore, there is evidence that such systems are often concentrated in socially deprived districts, creating the risks of stigmatisation of its residents. In terms of crime prevention there are indications that for many settings, sensors like CCTV are in the best case only part of a solution and they can create a tendency of reducing personnel on the ground, thus limiting the possibilities for classical policing and reducing the direct interaction between local police and public order services and the citizens. Such interaction is however key to address crime prevention and response to criminal threats in a holistic manner. The quantitative growth of both public and private surveillance has led to the fact that nowadays, citizens are hardly able to keep track of where their data has been captured and thus not able to make us of their rights as guaranteed by applicable legislation, such as the GDPR. While citizens as subjects of the surveillance are becoming transparent towards public and private operators of surveillance, the operators themselves remain in many cases inaccessible and few technological innovations are used to make sure only relevant data is stored and processed.

While significant industry and research resources are invested in the design of new and the upgrading of existing surveillance systems for public spaces, innovation could be stimulated to look for alternatives. Such alternative could identify means to protect public spaces though enhanced interaction with local communities, re-design sensors as to ensure they capture data in the most proportionate way, increase transparency for citizens towards public and private operators of surveillance systems and finally explore privacy-friendly technological features to ensure that only relevant data is kept, processed and accessible by authorised actors. **This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. Responsible Research and Innovation could be a relevant approach for the involvement of diverse stakeholders, launching debates, and co-developing or even implementing solutions.** In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content should be addressed only if the consortium deems it relevant in relation to the objectives of the research effort.

Type of action	Coordination and support action
Deadline	**23 November 2022**
Expected EU contribution per project	EUR 3.00 million
Topic information	Link

HORIZON-CL3-2022-FCT-01-05: Effective fight against corruption

Expected outcome

Projects' results are expected to contribute to some or all of the following outcomes:
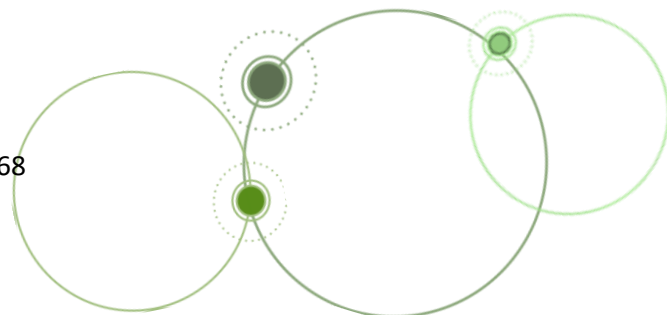
- Security practitioners and policy-makers are provided with improved and complete intelligence picture of corruption, such as modus operandi, both offline and online, including cross-border dimension, new trends, its social and economic impact, its role in enabling other types of crime, as well as its close links with money laundering;
- A comprehensive risk analysis is provided to security practitioners and policy makers on the new opportunities offered by the COVID-19 pandemic in terms of corruptive practices, cross-border dimension, its social and economic impact and sectors at high risk;
- European Police Authorities, Border Guards and Financial Supervisory Authorities benefit from better, modern and validated tools (including the lawful court-proof collection of crime evidence) and training materials to tackle criminal activities related to corruption and improve resilience for corruption acts;
- Improved strategies of cooperation between European Police and Border Guards Authorities in fighting corruption and dismantling related criminal networks;
- Improved policy-making related to the fight against corruption.

Scope

Corruption, a criminal category that ranges from bribery of public officials via sports to abuse of power and money laundering of proceeds from crime, is a strong enabler for crime and terrorism, and, as such, it constitutes a threat to security. By creating business uncertainty, slowing processes, and imposing additional costs, it has a negative impact on economic growth. Although the nature and scope of corruption may differ from one Member State to another, it harms the whole Europe by lowering investment levels, hampering the fair operation of the Internal Market and reducing public finances. The points where innovative solutions can help are threefold**. Firstly, there is a need to estimate the impact of corruption. It refers to social impact, factors that promote or hinder it, impact on vulnerable groups, economic, as well as fiscal and development costs. Secondly, the role of corruption as an enabler of other crimes deserves analysis as well**. Namely, corruption, increasingly facilitated by online services, is a fertile ground for organised criminal activities (human trafficking, smuggling…) and terrorism. For some criminal activities, corruption is an integral part of their modus operandi. Thus, relations with other types of crime should be explored too. Money laundering, closely linked to corruption, deserves special attention. Thirdly, innovative societal and technological solutions for prevention, detection and investigation of this type of crime are needed, including also the collection of cross-border court-proof evidence.

Therefore, activities proposed within this topic should address both societal and technological dimensions of corruption in a balanced way, taking care of the applicable legislation and fundamental rights. The international dimension should be analysed as well, hence both Police and Border Guards Authorities should be involved in the consortia, in order to tackle effectively all aspects of this crime. Due to the specific scope of this topic, international cooperation is encouraged. Coordination with successful proposals under topic HORIZON-CL3-2021-FCT-01-08, HORIZON-CL3-2021-FCT-01-09, HORIZON-CL3-2021-FCT-01-10, HORIZON-CL3- 2022-FCT-01-06 and HORIZON-CL3-2022-FCT-01-07 should be envisaged so as to avoid duplication and to exploit complementarities as well as opportunities for increased impact**. This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.**

Type of action	Innovation action
Deadline	**23 November 2022**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

Call – **Fighting Crime and Terrorism 2022**

HORIZON-CL3-2022-FCT-01-07: Effective fight against trafficking in human beings

Expected outcome

Projects' results are expected to contribute to some or all of the following outcomes:

- Security practitioners and policy makers are provided with an improved and more complete intelligence picture of trafficking in human beings, such as modus operandi, both offline and online, including the whole trafficking chain, cross-border dimension, new trends, relations with other types of crime, financial flows of the related profits, etc.;
- European Police and Border Guards Authorities benefit from better, modern and validated tools (including the lawful court-proof collection of crime evidence) and training materials to tackle criminal activities related to trafficking in human beings;
- Enhanced ability of security practitioners to detect and identify organised criminal groups involved in trafficking in human beings, in collaboration with citizens or NGOs when applicable;
- Enhanced ability of security practitioners to detect victims of all forms of exploitation, taking into account consistent patterns, and identify victims at an early stage;
- Enhanced ability of security practitioners to prevent the emergence of organised crime networks related to trafficking in human beings, to disrupt the trafficking chain at an early stage, deter organised crime groups related to trafficking in human beings and respond to the threat of existing organisations, as well as their potential expansion via de use of social media;
- Improved strategies of cooperation applied by European Police and Border Guards Authorities in fighting trafficking in human beings and dismantling related criminal networks, while respecting fundamental rights such as the protection of personal data, and improved cooperation between European and origin and transit countries authorities;
- Better policy-making related to the fight against trafficking in human beings.

Scope

Trafficking in human beings is a serious and organised form of crime that involves the criminal exploitation of vulnerable people, the goal of which is the economic gain. This crime is often cross-border and consistently the vast majority of its victims are women and girls, around one fourth of all victims being children. Around half of the victims are EU nationals within the EU. Trafficking can take place for various exploitation purposes, including sexual exploitation, forced labour, servitude, removal of organs, forced criminality (e.g., pickpocketing or drug trafficking). Trafficking in human beings is a grave violation of people's fundamental rights and dignity, and is explicitly prohibited by the EU Charter of Fundamental Rights. Understanding the nature, scale and costs of the crime is key to ensuring appropriate action at the European level to prevent the phenomenon. The 2017 Communication (COM(2017) 728 final) identifies as key priorities: to address the culture of impunity via disrupting the business model of criminals and untangling the trafficking chain; to provide a better access to and realise the rights of victims; to intensify a coordinated and consolidate response within and outside the EU. Innovation, reliable and comprehensive statistics are crucial in obtaining a complete intelligence picture of this crime, the modus operandi of the related criminal groups, identifying and addressing trends, developing evidence-based policy, and measuring the impact of individual initiatives. Innovative intelligence-based technological means of detecting, tracking and disrupting the online activities related to trafficking in human beings (including darknet) should be developed as well. The proposed activities would also aim to contribute to countering the culture of impunity by increasing the capacity of Police Authorities to detect the trafficking crime, the suspected perpetrators and the victims and to disrupt the business model and/or establish responsibility of all those involved in the trafficking chain.

Activities proposed within this topic should address both societal and technological dimensions of trafficking in human beings in a balanced way, taking care of the applicable EU legal and policy framework including fundamental rights and ethics. Since the international dimension of this crime should be analysed as well, both Police and Border Guards Authorities should be involved in the consortia, in order to tackle effectively all aspects of this crime, such as finding together means of disrupting the human traffickers' business model. Collaboration with Police Authorities, security practitioners and Border Guards Authorities from countries of origin or transit of criminal networks would be an added value. Coordination with successful proposals under topic HORIZON-CL3-2021-FCT-01-08, HORIZON-CL3-2021-FCT-01-09, HORIZON-CL3-2021-FCT-01-10, HORIZON-CL3- 2022-FCT-01-05 and HORIZON-CL3-2022-FCT-01-06 should be envisaged so as to avoid duplication and to exploit complementarities as well as opportunities for increased impact. Proposed activities that could also link with security research for border management (e.g., border checks or security controls) would be an asset. **This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities**. Due to the specific scope of this topic, in order to achieve the expected outcome, international cooperation is encouraged.

Type of action	Innovation action
Deadline	**23 November 2022**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link
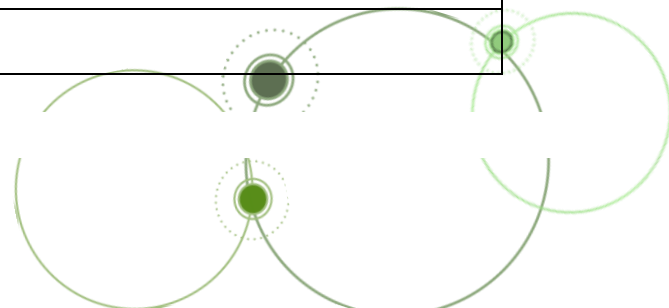
HORIZON-CL3-2021-DRS-01-01: Improved understanding of risk exposure and its public awareness in areas exposed to multi-hazards

Expected Outcome

Projects' results are expected to contribute to some of following outcomes:

- Advanced disaster / crisis simulations and impact assessments supporting decision-making processes based on best available knowledge, adaptive strategies and methodologies, including accurate exposure data and adequate vulnerability assessments, quantitative hazard information with comparable metrics across different risks (especially addressing multi-hazard situations), including disaster loss data and qualitative information issued from historical testimonies and case studies.

- Risk and resilience assessment solutions, studies and outputs in support of long-term multi-hazard management strategies (e.g. climate adaptation, disaster risk reduction and prevention and mitigation strategies) with a focus on vulnerable regions prone to multiple hazard occurrences, involving interdisciplinary teams in different scientific and technological fields (such as geology, climate, man-made hazards, critical infrastructures and assets, history, health sciences, economics and social sciences). This requires novel interdisciplinary risk approaches to assessing human-hazard interactions, and reaching the most vulnerable segments of the community.

- Advanced data management, information update and forecast / early warning systems (including via satellite and in-situ observation) in support of evolving public understanding and decision-making needs in the field of multi-hazard preparedness policy and planning, taking into account data uncertainties and including the determination of baseline scenarios and corresponding risk thresholds, as well as data potentially available (e.g. from surveys, earth observations, historic databases, academic and business/private sector repositories, climate projections, etc.) and near-real-time impact simulations combined with data-farming approaches.

- Communication and dissemination platforms supporting an increased dialogue and cooperation between scientific, technological, practitioners, policy-makers, private sector (e.g. insurers), NGOs, citizens and community-based organisations for sharing and building-up the knowledge of hazards and related risks for a comprehensive awareness (and preparedness) of the risk at all levels (risk memory and implementation of lessons learnt into policy actions), taking into account various uncertainties that may affect decision-making.

Scope

The awareness of multiple hazards and the understanding and the assessment of risks and their consequences is a critical and fundamental step towards the development of local, national and international policies and strategies within all phases of the disaster risk management cycle, in particular preparedness. The availability of reliable scientific data and information (including historical occurrences and climate projections) to anticipate future disaster events or crisis situations, considering uncertainties inherent to natural systems characterization, and effectively support decision-making processes at all levels represents a global challenge for both the research community and governance institutions. Actions at national/local and global/regional levels rely on knowledge of risks in all its dimension and changeable nature. A strengthened understanding of risks by the population (and decision-makers) is needed, based on both records of past events and forecasts and projections (with quantified uncertainties) that reflect consideration of evolving trends and dynamics over time and space. This is particularly acute in the case of multi-hazard risks, i.e. occurrences of several disasters either in cascade or at once. Moreover, the work needs to be complemented with improved knowledge on how risk awareness and actions are influenced and shaped by diverse aspects such as past events, cultures and traditions.

The understanding of multiple disaster risks (and related awareness) relies on knowledge gained about historical data and information about past events and related lessons learned as well as the ability to forecast and assess future risks under uncertainty (including impacts of pandemics, as well as global change, including climate trends and earth system and environment dynamics). These complex interactions between human decisions and multiple hazards require novel risk assessment approaches such as agent-based modelling and systems dynamics methods. This will result in improved preparedness actions built upon these analyses (e.g. defining evacuation routes, responsiveness of health services, etc.). Social media also plays a role in disaster analytics. For example, an increasing number of location-based social network services can provide time-stamped, geo-located data that opens new opportunities and solutions to a wide range of challenges by analysing the extracted public behaviour responses from social media before, during and after disaster events. When using social media data, the design for data collection and analysis has to respect fundamental rights, privacy and data protection and analyses have to take related societal effects in online and offline environments into account as well as possible disinformation and fake news. Also, risk awareness, understanding and preparedness are unequally distributed along a wide range of variables (socio-economic, cultural, regional etc.) that may generate drawbacks and conflicting issues with respect to groups' vulnerability.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. The involvement of citizens, civil society and other societal stakeholders in codesign and co-creation should be promoted. In order to achieve the expected outcomes, international cooperation is encouraged. Where possible and relevant, synergy-building and clustering initiatives with successful proposals in the same area should be considered, including the organisation of international conferences in close coordination with the Community for European Research and Innovation for Security (CERIS) activities and/or other international events.

Net4Society

Type of action	Research and Innovation action
Deadline	**23 November 2021**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

HORIZON-CL3-2021-DRS-01-02: Integrated Disaster Risk Reduction for extreme climate events: from early warning systems to long term adaptation and resilience building

Expected Outcomes

Projects' results are expected to contribute to some of the following outcomes:

- Improved dialogue and cooperation among scientific and technical communities, stakeholders, policy-makers and local communities in the field of extreme climate events and associated events (e.g. forest fires, droughts, floods, heatwaves and storms) and disaster risk reduction.
- Enhanced community engagement for prevention, preparedness, response, recovery and learning to extreme climate events by strengthening knowledge and involvement of volunteers linked to recognised organisations into the planning, design and implementation of prevention, including building with nature, preparedness and emergency response activities.
- Strengthening of disaster risk reduction and resilience building through innovative use of media means, namely by examining the potential of new communication tools and apps for better preparedness and response.
- Overview of existing knowledge, tools and development of new tools (innovative data collection, satellite data, data harmonisation, artificial-intelligence tools, algorithms, sensors and decision-aid approaches) for early warning, response and resilience / adaptation to be demonstrated in the framework of real-case scenarios designed for training addressed to first and second responders, (national, regional, local) authorities and populations. The overview should document how legal and ethical rules of operation as well as fundamental rights such as privacy and protection of personal data are taken into account.
- Based on the demonstrations, development of new governance strategies and robust decision-support methodologies for integrated risk reduction and improved adaptation to climate extreme events.
- **Improved understanding of enablers and barriers to multi-risk governance frameworks and multi-risk thinking, by involving interdisciplinary teams in different fields, particularly the social and behavioural sciences**.
- Cost-benefit or cost-effectiveness analyses of investment and regulatory strategies to protect people and nature in vulnerable areas.
- Identification of production/livelihood practices (goods, services, activities etc.) at community and national level that contribute to increased local/global climate risks, and explore how these can be adapted so that they are both economically and environmentally sustainable.

Scope

In contemporary society, the capacity of communities and governments to manage expected and/or unexpected extreme climate events depends heavily on effective governance throughout the entire Disaster Risk Management cycle. This covers operational mechanisms ranging from short-term actions (e.g. early warning and forecast-based actions) to long-term adaptation strategies and resilience building, including nature-based solutions. A coherent integration between Disaster Risk Reduction, Climate Adaptation policies and Sustainable Development Goals as fostered by the European Green Deal and major UN initiatives should result in a comprehensive resilience framework, while improving synergies and coherence among the institutions and international agencies involved.

The effective implementation of global and European risk governance and policies to enable integrated disaster risk reduction for extreme climate events requires a collaborative involvement in risk assessment and information sharing across involved institutions, including the civil and private sector and the population. Cross-regional, cross-border and cross-sector agreements covering all phases of Disaster Risk Management can improve the knowledge about extreme climate events such as forest fires, droughts, floods, heatwaves, storms and storm surges. In addition, improving effective prevention, preparedness and response rely upon specific national or local expertise and experience. It is important to overcome silos between technical and political authorities at all levels and advocate integration among involved actors. Multi-risk governance frameworks related to climate extremes, shifting from single to multi-risk thinking in governmental agencies, represents the key challenge for the future, considering how measures to improve the resilience of the built environment and communities may provide effective solutions to strengthen adaptation measures. Creating an overview of
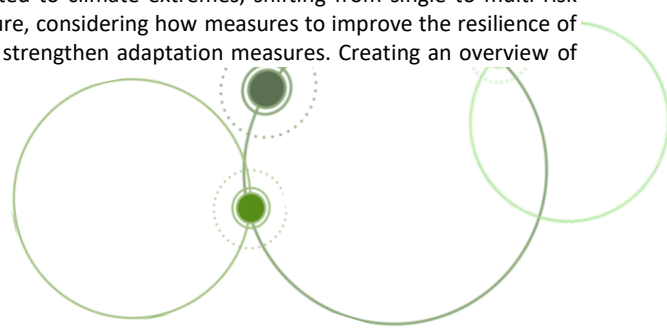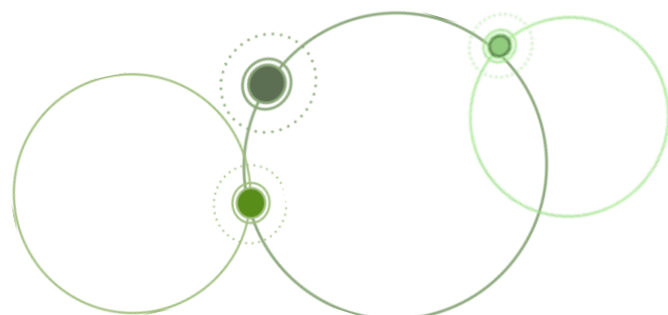
existing knowledge, integrating tools and developing new ones for resilience and emergency management should include careful planning for interoperability amongst many actors. It is important that solutions pay attention to societal side-effects of integrating data about emergencies, for instance Apps, where persons concerned tend to share more willingly, but do not reflect consequences of that. Thus, the development of data management tools for emergencies need to respect fundamental rights, data protection and avoid function creep.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Where possible and relevant, synergy-building and clustering initiatives with successful proposals in the same area should be considered, including the organisation of international conferences in close coordination with the Community for European Research and Innovation for Security (CERIS) activities and/or other international events.

Type of action	Innovation action
Deadline	**23 November 2021**
Expected EU contribution per project	EUR 6.00 million
Topic information	Link

HORIZON-CL3-2021-DRS-01-03: Enhanced assessment of disaster risks, adaptive capabilities and scenario building based on available historical data and projections

Expected Outcome

Projects' results are expected to contribute to some of the following outcomes:

- **Innovative exposure and vulnerability analysis methods, including those that take a systemic perspective by integrating sectoral expertise (e.g. social science, human health, cultural heritage, environment and biodiversity, public financial management and key economic sectors) and identifying key vulnerable groups and assets.**
- Maximising usability through a service-oriented approach, including through the optimisation and tailoring recommended practices, scientific models and scenarios for the intended users to support technical policy improvements and implementation of actions.
- Enhanced exploitation of monitoring data and satellite/remote sensing information as well as artificial intelligence to improve high-level assessment from international to local levels, identifying the major sources of uncertainty in hazard assessment and ways to reduce them.
- **Evaluation of existing disaster risk and resilience assessment and scenarios (at national and local levels), taking into account historical / geological data, monitoring, risk and forecasting data, and based on the evaluation, serious games, modelling of future scenarios accounting for current and future impacts of diverse extreme events and disasters.**
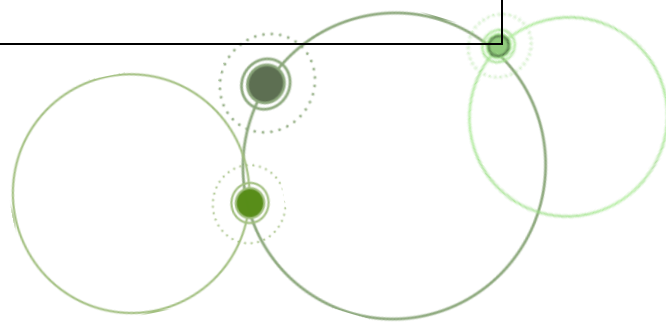
Scope

The assessment of disaster risks requires different types of actions ranging from soft measures to technologies. Simulation-based risk and impact assessments represent an effective approach to make science understandable to decision makers and streamline national to local mitigation/adaptation actions. This is especially the case if they are integrated with evaluation tools for cost-benefit/effectiveness and multi-criteria analyses, data-farming experiments, serious games, and are tailored to meet end-user's needs, to assess the effectiveness of alternative options in different phases of the Disaster Risk Management cycle. Specific risk assessments should be decision- or demand-driven and informed by scientific evidence, and there is a clear need to translate the results to ensure they are relevant, usable, legitimate and credible from the perspectives of the users. Co-design, co-development, co-dissemination and co-evaluation engaging the intended end users represent in this sense key features of improved risk, resilience and impact assessments. In a first place, the acquisition of data is an essential feature and this requires innovative solutions for faster risk assessment and reduction. This includes the identification of precursors for different types of threats, supporting the design or improvement of risk-targeted monitoring programmes. In addition, risk assessments themselves are primarily designed to predict the likelihood of a specific event, whereas what is of primary concern is the impact of that event on society, infrastructure, governance, etc. Numerous experiences gathered in the natural hazards area showed that an enhanced assessment of risks and scenario building may be improved by taking into account reliable data (both quantitative and qualitative) **and historical occurrences**, when available, including disaster loss data (studies of past events in particular low-probability / long-time recurrence events). This includes for example a higher completeness of the historical-geological records of volcanic eruptions, major earthquakes, tsunamis etc. In the case of extreme climate events such as storms and related storm surges, or health crises (outbreaks, pandemics) the analysis should draw on the outputs of state-of-the-art climate projections, including by taking into account the uncertainties brought on by climate change and our state of knowledge of the key processes underpinning the functioning of the Earth system.In cases where there are not be enough historical data and a high level of uncertainty, assessments and decision making will have to rely on qualitative data. The action should take into account disaster loss databases and risk data repositories in Member States and relevant hubs.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

In order to achieve the expected outcomes, international cooperation is encouraged. Where possible and relevant, synergy-building and clustering initiatives with successful proposals in the same area should be considered, including the organisation of international conferences in close coordination with the Community for European Research and Innovation for Security (CERIS) activities and/or other international events.

Type of action	Research and Innovation actions
Deadline	**23 November 2021**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

HORIZON-CL3-2022-DRS-01-01: Enhanced citizen preparedness in the event of a disaster or crisis-related emergency

Expected Outcome

Projects' results are expected to contribute to some of the following outcomes:

- Design of preparedness actions linking together multilevel interventions that need to involve citizens, communities, business organisations, public administrations for empowering citizens and their communities to act by themselves together with emergency services and managing spontaneous volunteers in the case of a disaster or crisis-related emergency of any kind (natural hazards, including pandemics, or man-made including terrorist threats) in the form of best practices and guidelines exploiting local resources (knowledge, networks, tools) developed with practitioners and local decision-makers.
- **Development of effective means for communication improving inter-organisational collaborative processes e.g. early warning systems and communication chains, roles, tasks and responsibilities of citizens, communities, local authorities, NGOs, business companies and practitioners, taking into account the legal framework, procedures for normal operation and organizational boundaries**.
- Improved early warning systems, forecasts and strategies to reach different public representatives with proper messages in the event of a disaster.
- **Demonstration exercises involving citizens, training and educational institutions, local decision-makers, employees in public administrations and in business companies, and practitioners, to identify practices, test guidelines and communication strategies in nearreal-case situations in the framework of field exercises, virtual trainings and serious gaming, school / university curricula and professional training.**
- **Building a 'culture of disaster preparedness' for citizens, communities, public administrations, business companies, practitioners: Development of an effective education system and integration of theory and practice of preparedness in school curricula**; development of an effective integration of multilevel action in public administration (at local and regional national and international levels) focusing also on responsibility and deliberation issues; development of effective preparedness practices for citizens, communities, business organisations and practitioners (and their associations).
- Deployment of evidence-based assessment methods/models to monitor and strengthen emergency preparedness.

Scope

Improving societal resilience to disasters or crises relies on various features related to preparedness of citizens, communities, education systems, public administrations, business companies and practitioners. These concern, in particular, ways to react and informed decisions to take in case of an event. Individual, public and multi-level actions are needed in disaster risk management and they have huge implications on potentially reducing losses and increasing the operational capacity of responders, along with significant impacts on the emergency planning and management phases and its relation to continuous operations and existing safety management. In particular, the level of awareness of EU citizens of the risks in their region is an indicator for measuring progress in increasing public awareness and preparedness for disasters and in the implementation of the Union Civil Protection Mechanism legislation.

Besides the required risk understanding dealt with in topic CL3-2021-DRS-01-01, research is needed in several domains. With regard to public administrations, it is relevant to conceptualise how to increase risk awareness by building processes capable of fostering a long-lasting coalition with citizens around the objective of reducing vulnerability. This implies the definition of action protocols and models of responsibility that mobilise the intervention of individual employees of public administrations. With regard to business companies and practitioners, it is relevant to integrate their emergency activities in the local context. With regard to citizens and communities, it is necessary to design preparedness actions enabling an empowerment of citizens (including particularly vulnerable groups), their communities and NGOs through bottom-up participatory and learning processes. This includes school/university curricula and professional training and trust building among local actors, integrating relevant traditional knowledge, incorporating a gender perspective where relevant, best practices, guidelines, and possible changes of regulations, to allow participatory actions. Difficulties in communication to the public in preparedness (and response) phases requires the consideration of legal aspects, along with investigations into innovative practices, forms and tools that will enable the more effective sharing of information, taking into account possible risks of disinformation and fake news. These will support citizens in acting efficiently by themselves, through enhanced collaboration and communication and improving information exchanges between local authorities (including first and second responders), vulnerable populations (e.g. socio-economic groups, ethnic groups, people with illnesses or disabilities, children, elderly, hospital patients), and the private sector. Moreover, recent crises have shown that there is a large sense of solidarity among the population during a disaster or crisis situation. Many citizens that were not involved in disaster relief organisations before the crisis want to offer support to their fellow citizens and the broader community in times of crises. These initiatives of "spontaneous volunteers" are however most efficient if they are informed and trained and if their valuable contributions are coordinated with the authorities and first and second responders on the ground. Preparedness plans, tests and continued adaption on how best to manage spontaneous volunteers and integrate those into the response are needed.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. In order to achieve the expected outcomes, international cooperation is encouraged.
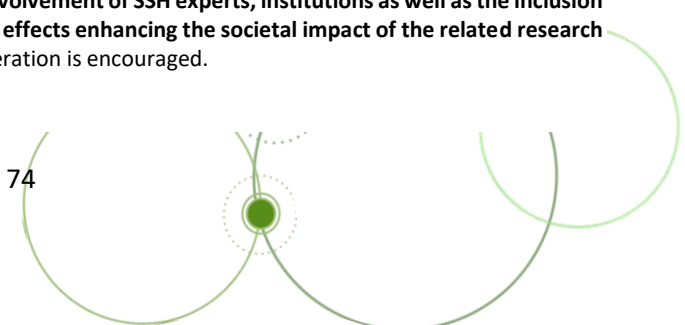
Call – Disaster – Resilient Society 2022

Type of action	Innovation actions
Deadline	**23 November 202**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

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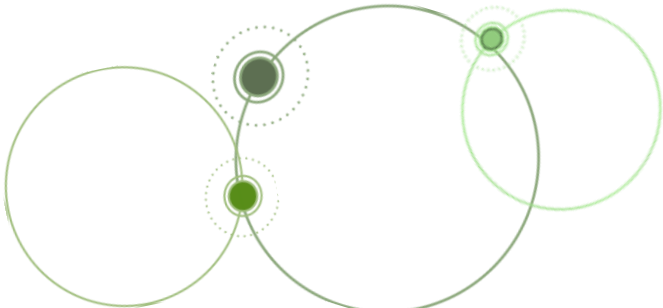
HORIZON-CL3-2022-DRS-01-02: Enhanced preparedness and management of High-Impact Low-Probability or unexpected event

Expected Outcome

Projects' results are expected to contribute to some of the following outcomes:

- Increased understanding of high impact-low probability events in the short and medium term, both from natural and man-made hazards. **These perspectives include cultural, societal, regional, ethical and historical contexts.** This should capture new and emerging risks and develop end-user-friendly tools for risk assessors to conceptualise such risks.
- Improved methods/tools for decision-making under uncertainty to prepare for high-impact low-probability events**. These methods could include the impact of past events, communication and linguistic components, and regional specificities.** These should be developed in close cooperation with end users to maximise application of these tools in practice.
- Better preparedness for and management of high-impact low-probability risks that most, if not all, experts have difficulty conceptualising (the unexpected events), including by developing no-regret options that can address different kinds of impacts irrespective of the cause.
- **Improved mapping of i) socioeconomic systems' interdependencies that can be negatively affected by high-impact low-probability events, and ii) which systems contribute to the materialisation of high-impact low-probability risks by increasing societal vulnerability.** This would be supported by identification of interventions where resilience-building would be most effective. This identification could be based on an in-depth understanding of past events, **a mapping of the current societies' cultural sensibilities in a geographical space / region context, and/or their ethical and legal contexts**.
- Improved preparedness at an individual level, at local level and at the governmental level, including through clarifying roles and responsibilities around management of high-impact low-probability events. An improved understanding of existing risk and resilience management capacities across Europe at national and regional levels for responding to high-impact low-probability risks that Europe may face.
- Development of appropriate simulation tools to identify areas under higher risk of occurrence of HILP events and development of preparedness plans and management mechanisms, including communication, to address the effects of such occurrence.
- Combination of qualitative and quantitative approach strategies, which encompass practical and probabilistic knowledge to increase the success rate of identifying and adequately monitoring fast developing risks into potential high-impact low-probability events
- Multi-disciplinary reference library around HILP events and their impacts would allow to build up a record of observations that can help quantify the impacts and, by analogy, similar risks that might arise in the future.
- Scenario-building exercises and stress-test risk-related practices in critical infrastructure sectors (e.g., transport, communications, energy) would enhance preparedness and help identify particularly affected social groups while enabling rapid financial and practical support where national organizations are unable to cope or where the consequences are cross-border in nature. Independent, high-quality hubs (national or regional) for up-to-date risk notification and provision of scientific information and communication in a crisis – supported by governments, businesses and industry associations.

Scope

The risk landscape has changed significantly over the last decades. With new and emerging risks and risk magnifiers such as climate change, cyber threats, infectious diseases and terrorism, countries need to anticipate and prepare for the unexpected and difficult to predict. At European level, there is, however, no agreed definition nor methodology to characterise HILP and unexpected events, resulting in differing impact scales and a lack of comparability of risk ratings among National Risk Assessments. High-impact, low-probability risks (HILP/Hi-Lo) can be understood as "events or occurrences that cannot easily be anticipated, arise randomly and unexpectedly, and have immediate effects and significant impacts". They can manifest themselves not only as one-off high-profile crises and mega-disasters (e.g., Fukushima Daiichi Nuclear Accident, eruption of the Eyjafjallajökull volcano, 9/11 terrorist attack in the U.S. and COVID-19 pandemic) but also as lower-profile, persistent events with equally serious impacts such as flooding, droughts and cyclones which, owing to the low likelihood of occurrence or the high cost of mitigating action, remain un- or under-prepared for. High-impact, low-probability events (HILP) and their cascading effects raise many challenges for governments, businesses and decision-makers, including defining where the responsibilities lie in preparing for both individual shocks and slow-motion trends (e.g. global warming, tipping points, sea level rise) that tend to increase their magnitude and frequency. A 2019 revision of Decision 1313/2013/EU on a Union Civil Protection Mechanism has brought attention to high impact low probability risks and events, now requiring Member States to take prevention and preparedness measures to address them where appropriate, and the EU fully financing capacities through rescEU to respond to high impact low probability events. To get the right balance between planning for specific 'known' events and creating generic responses for events that are rare or unexpected, research should support the anticipation and management of shock events through improving planning processes, establishing broader risk-uncertainty frameworks that capture such events, enhancing business resilience and responses to shocks, and stepping up communications in a crisis. Preparing for and managing the consequences of a HILP event will benefit firstly from developing an increased understanding of new and emerging risks, besides the required risk understanding dealt with in topics CL3-2021-DRS-01-01 and CL3-2021-DRS-01-02, and in close connection to them. Improved methods should also be sought to support risk assessors and decision-makers in
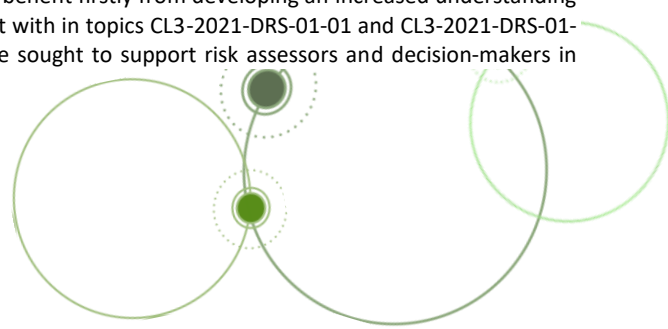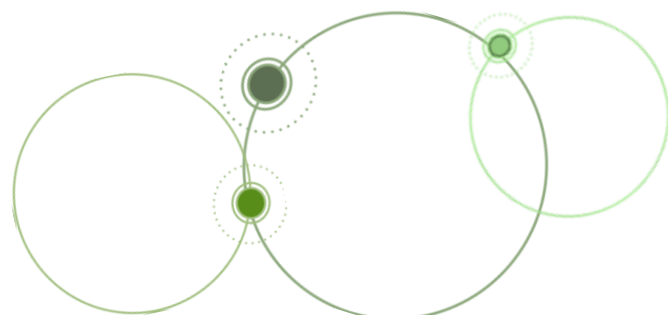
conceptualising these risks and developing no-regret options to manage them. A thorough understanding of existing risk management capacities across Europe at national and regional levels for responding to high-impact low-probability risks that Europe may face would contribute to improving preparedness at the European level to risks that can affect multiple countries at once and overwhelm national response capacities. Finally, enhancing preparedness for and management of high impact low-probability events cannot happen without an increased resilience of individuals. In close connection to topic CL3-2021- DRS-01-02, research is also needed on how to prepare citizens for unfamiliar risks and what information to disseminate, and how to communicate, during the disaster or crisis-related emergency in order to manage panic, confusion and threats of disinformation.

Given the practical nature of this topic, co-design, co-development, co-dissemination and co-evaluation of the research outputs engaging the intended end users will be particularly important. This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Type of action	Research and Innovation actions
Deadline	**23 November 2022**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

HORIZON-CL3-2022-DRS-01-04: Better understanding of citizens' behavioural and psychological reactions in the event of a disaster or crisis situation
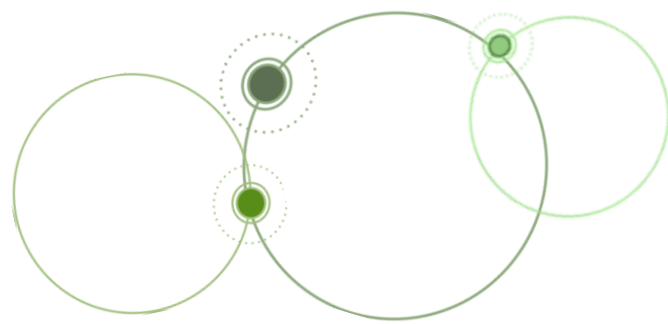
Expected Outcome

Project results are expected to contribute to some of the following expected outcomes:

- **Qualitative and quantitative analyses on the behaviour of diverse society groups affected by a natural and man-made disaster or crisis situation, during and after an even occurs, based on real cases and testimonies, lessons learned from past disasters or crisis and recommendations from citizens and local authorities**. Examine how this analysis could be integrated into preparedness plans and processes to include cultural, historical, and ethical perspectives on what defines disasters and how they are responded to.
- **Analyses of human behaviour as triggering or cascading factors of disasters or crisis situations,** and transformation of qualitative data into quantitative information to improve vulnerability and exposure analyses.
- Development of community-centred (vis-à-vis victim- or patient-centred) approaches and corresponding preparedness plans: in view of limited emergency response capacities and threat of systems collapses (e.g. health system, food distribution, supply chains) in large-scale disaster scenarios, analyse what community practices and communication strategies can help mitigate the latter and enable the public to be a capable partner in emergency planning and response.
- Specific measures to better address the needs and requirements of most vulnerable groups (chronic suffers, persons with disabilities, children, elderly persons, economically and social deprived persons, refugees and irregular migrants in emergency planning and recovery measures.
- **Analyses of the nature and scope of mental health issues of the affected populations and of first-responders** arising during and following natural or man-made disasters or crisis situations and their implications for response and recovery, and options to address these issues, including through social and health services such as emergency psycho-social support.
- Analyses of mechanisms and factors that can lead to false alarms and misdirected actions, and of the direct consequences on both population and decision-makers.

Scope

Human actions and behaviour may strongly influence the effects and dynamics of a disaster or crisis situation and on the response, potentially modifying the vulnerability of the population. For example, inadequate design of technological systems may favour cascading consequences due to limited consideration of human performance, and insufficient planning. Linked to this, due to extreme time pressure, crisis managers are often forced to make decisions on the basis of inadequate information. **The behaviour of the general public, mostly influenced by demographic factors** (e.g. gender, age, income, education, risk-tolerance, social connectivity etc.) and the perception of risks, depends on the availability, form and access to information about the crisis and management of trade-offs (e.g. efficiency and thoroughness trade-offs). Social media play an important role here being a means of disinformation and misinformation. Recent disasters related either to natural causes (including climate-related and geological hazards), man-made causes (including industrial accidents or terrorist attacks) or the COVID-19 pandemic crisis have shown the lack of sufficient knowledge in the way citizens react in case of disasters or crisis situations, with implications on policy design and implementation for example in the form of preparedness plans. In this respect, **taking into account the knowledge gathered by projects funded in Horizon 2020 and ensuring complementarity, behavioural and psychological research on how citizens behave in the event of a disaster or crisis** situation is needed to better understand how to best raise awareness in the population and develop tools to facilitate this. **It is hence necessary to better investigate how historical, cultural and emotional factors (e.g. anxiety, panic etc.) during a disaster or a crisis influence rational actions, evaluations of options and information seeking**. In addition, the impact of disasters on health also requires looking into the short and long-term consequences of exposure to high stress/threat levels bears, in particular for mental health. Where possible and relevant, synergy-building and clustering initiatives with successful proposals in the same area should be considered, including the organisation of international conferences in close coordination with the Community for European Research and Innovation for Security (CERIS) activities and/or other international events.

Type of action	Research and Innovation actions
Deadline	**23 November 2022**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

Call – Support to Security Research and Innovation 2021

HORIZON-CL3-2021-SSRI-01-02: Knowledge Networks for Security Research & Innovation

<u>Expected Outcome</u>

Projects are expected to contribute to all of the following expected outcomes:

- Enhanced analytical capacity to support the programming of EU-funded security research and capacity building funds through a periodic and timely evidence-based policy feedback;
- Periodically aggregated and consolidated view of the capability needs and gaps in the thematic areas under consideration;
- Periodically aggregated and consolidated view of the state-of-the-art technologies, techniques, methods and tools that can contribute to fill the identified capability gaps;
- Periodically aggregated and consolidated view of outcomes (including on technological, industrial, legal and ethical issues), future trends, lessons learnt and best practices derived from past and current security research effort incurred in the thematic areas under consideration.
- More systematic assessment and validation of the outcomes of EU-funded security research projects with respect to identified capability gaps through harmonised support mechanisms;
- Common and updated map of opportunities and constraints for the exploitation of EU security research and innovation projects, with special focus on industrialisation, commercialisation, adoption and deployment of innovative solutions in response to common capability gaps;
- Common and updated map of areas requiring standardised solutions and/or certification schemes to foster innovation uptake and market creation, as well as trainings and options for the implementation of such schemes.
- Enhanced cooperation between research institutions, smaller private research agencies, security practitioners, SMEs and community representatives to support integrated participation in requirements determination and analysis, research and validation and evaluation of results.

<u>Scope</u>

Innovation uptake is not a linear process, and even less a single-step process that happens only at the end of a research project and it is not automatically enabled by a successful research result. The innovation uptake process begins with the identification of a need and ends with an innovative solution deployed on the field of operations, being R&I only one of the many contributors to the overall process, but not the first and not the last. In other words, successful results of research projects are a necessary but not sufficient condition to guarantee the uptake of innovation. Investment in security research needs to be designed taking into consideration how and when it can deliver outcomes that contribute to the development of security capabilities. Therefore, research will be undertaken, from its very early stages, in a way that addresses real needs while guaranteeing the impact in the final solutions. It will also ensure to identify and underpin the factors that could help in the implementation of its results. However, the programming of research is highly conditioned by the quality, reliability and timeliness of the evidence that supports its decision making process. This includes the identification and understanding of the contextual elements that can or will influence or be influenced by the research (process), the research team and the research projects themselves. The European Commission and the EU Member States carry out this programming exercise periodically, taking into account a wide variety of inputs. The complexity of the challenge is notable, considering that the EU security landscape is volatile, uncertain, complex and ambiguous in what regards the security threats, the capabilities required to face them, the evolution of modern technologies, and the skillset needed to deploy those. In order to carry out a sound programming exercise, the European Commission and the EU Member States strive to consult and involve all actors. With that aim, experts are gathered in different configurations and their inputs are coordinated at EU and national levels to be factored in by the decision-making bodies of EU-funded security research. These experts require high quality, reliable and timely evidence to support their assessments, but information is often scattered, hardly visible and requires bespoke processing for the detection of patterns and for the generation of actionable intelligence. In other cases, it is simply not presented in the right format to unveil its value. Applicants are invited to submit proposals for the establishment of Knowledge Networks for Security Research & Innovation. The role of these networks is to collect, aggregate, process, disseminate and exploit the existing knowledge to directly contribute to the expected outcomes of this topic. Networks should engage with the main sources of information in order to have a sound and updated picture of the aspects mentioned above. This includes interaction with security experts (beyond the members of the project consortium), organisations, projects or initiatives, but also an extensive review of available databases, studies, reports or literature (notably all information generated under the EU-funded security research programmes, and possibly under other EU or MS funding programmes).

The networks must ensure the dissemination and exploitation of their findings to the different communities of the security research ecosystem, including policy makers, security authorities, industry, researchers and citizens. Special emphasis needs to be made on the contribution of these networks to the work of entities and initiatives established by the European Commission (e.g. Union Civil Protection Knowledge Network) and the EU Agencies to contribute to the security research programming effort In this regard, the networks should contribute timely and intensively to the work of the Thematic Working Groups of the Community of Users for Secure, Safe and Resilient Societies (future CERIS –Community of European Research and Innovation for Security) and of other equivalent innovation labs/groups set-up by EU Agencies (e.g. Frontex). The networks have to contribute to these working groups with the quantitative and qualitative evidence required to carry out their activities in support to a more impactful EU-funded Security R&I and to a more frequent and systematic innovation uptake.
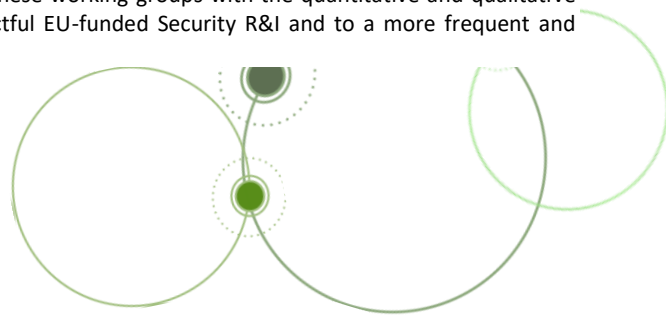
Each proposal should include a plan, and a budget amounting at least 25% of the total cost of the action to carry out activities involving industry, academia and other providers of innovative solutions outside the consortium, for example with the aim to assessing the soundness of their findings, give support in validation processes, promote competitive development (e.g. via prizes) or dissemination of results, among other options. The networks must be in a position to deliver findings on the abovementioned challenges starting from the month 6 of the project and periodically every 6 months or less, in accordance with the information needs of the entities and initiatives they are contributing to. Proposals should clearly describe the process and timing for the collection of inputs and the generation of outcomes. This plan has to go beyond the description of project deliverables and milestones, and describe in detail how and when the findings will be disseminated and exploited during the project and in collaboration with the communities described above. The applicants submitting the proposals have to ensure sufficient representativeness of the communities of interest (including, but not only, geographical representativeness) and a balanced coverage in terms of knowledge and skills of the different knowledge domains required to face the challenge, including security operations, technologies, research & innovation, industry, market, etc. The applying consortia need to demonstrate that the project beneficiaries guarantee the expertise required to steer the project activities in all the knowledge domains to ensure the success of the action. The work of the partners has to be supported by solid and recognised tools and methods, also accompanied by the required expertise to put them in practice.

The networks should build to the extent possible on the work initiated by the Networks of Practitioners funded under H2020 Secure Societies work programmes. Should such networks be still ongoing, maximum cooperation and minimum overlapping should be ensured and demonstrated.
Under this call, the applicants are invited to propose networks on the thematic areas of:
Option A: Border Security;
Option B: Resilient Infrastructure.
Only one network in each area can be funded.
The project should have a maximum estimated duration of 3 years.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Type of action	Coordination and Support Actions
Deadline	**23 November 2022**
Expected EU contribution per project	EUR 2.00 million
Topic information	Link

HORIZON-CL3-2021-SSRI-01-05: Security research technologies driven by active civil society engagement: transdisciplinary methods for societal impact assessment and impact creation

Expected Impact

Projects' results are expected to contribute to the following outcomes:

- **Promotion of socially and environmentally sustainable products and services through stronger civil society engagement**;
- **Policy-makers, security practitioners and the research community implement security technological solutions and policies that fulfil both societal and legal requirements, such as inclusiveness, accessibility, universal design, openness, legitimacy, proportionality, ethics**;
- State and non-state actors base their decision-making on an assessment of any possible negative societal impacts of security research outputs, including human rights implications and risks of ill-intended use;
- Security practitioners and citizens are provided with technical solutions that are transparent, privacy-sensitive, open source, friendly and easy to use;
- Security practitioners and citizens have the necessary skills and knowledge on the use of the new technologies being produced, as well as their impact on the society;
- Security practitioners have a broader understanding of the new opportunities offered by technological developments, including accessibility and universal design aspect of technologies which goes beyond the mere response to security challenges to ensure that everyone is included;
- Security practitioners, the research community and policy-makers build upon existing knowledge on lessons learned and best practices, as well as recommendations and good examples of how the EU is using technology to combat risks to security while respecting and promoting fundamental rights.

Scope

Applied research derives its meaning, and therefore, its financial justification from its relevance to society, to society's needs, to society's values, to its aims, needs or ambitions. Applied research presupposes that a distinct societal need is identified and that a programme of research is devised to provide the concrete knowledge required to meet that need as well as to better understand areas related to experience and requirements of technologies regarding vulnerable groups through universal design and common accessibility principles. The finality and value of applied research is assessed on the grounds of this relevance, on the degree to which the results of the research can be applied to one or several problems beyond or after the research itself. The salience and value of any type of applied research – including security research – lies outside the research itself and in its impact on society. In general, research can have an impact on society at two different points: at the level of the scientific methodology that employs and at the level of the scientific outputs that generates and communicates. Any action can have desirable and undesirable outcomes. Undesired results of security research can include both the results of research that does not reach its intended aims or research that does not reach its aims, but whose aims do not provide the security it originally set out to provide. Significantly, it can include particular measures that have as a secondary effect an increase in insecurity such as the development of technological solutions. In innovation processes and advances of technological change, the societal aspect covers all those areas that influence the citizen, society and the state. This can range from privacy issues and confidentiality to the use of products and services, the potential for misuse of information and data, fake news, security marking, secure infrastructure etc. Technological solutions in the area of civil security for society are often perceived as intrusive means to intensify and broaden surveillance and control of citizens in a top-down approach. Security technology is addressed with mistrust as regards to its detrimental effects on civil liberties and raises questions on fundamental rights and freedoms, privacy and data protection. Nevertheless, a wide variety of technological tools is available in different languages for different risk scenarios and with different functionalities. At the same time, technology can also be applied to increase societal resilience, improve and strengthen horizontal coordination, raise citizens' awareness and facilitate exchange of information among citizens in crisis' situations, disasters or pandemic risk incidents. Strengthening a coproductive use of technology to enhance societal resilience requires a better understanding of inclusive design, crowd-based, and Information and Communication Technologies (ICT)- enabling horizontal communication processes.

A systemic stock of such technologies, including an evidence-based assessment of the number of users in Europe and an evaluation of their impact in past human life disasters or crisis management incidents can help to improve the societal acceptability, directionality, desirability and ethicalness of security research and innovation. **A societal development plan that examines the socio, economic, political context, which might have caused the security problems, can also help to learn from past-experiences**. Demonstrating awareness of the risks that potentially build biases into automated systems would be important to identify best solutions for relevant functionalities and pave the way for a coordinated European approach, which strikes the right balance between practitioners' technology requirements and privacy-friendly tools and solutions for the citizens. Furthermore, improved knowledge of relevant human and societal factors in order to assist, supplement or override human misjudgement, lack of compliance or understanding through education and training modules can better achieve the desired impacts on attitude and behaviour change creating resilience to security threats. In assessing the impact of security technologies, proposals are expected to examine methodologies that allow citizens genuine participation, including the vulnerable groups and people with disabilities in innovation processes. **A socio-technical approach can enhance the ambition and effectiveness of innovations by inspiring socially acceptable design for systematic change and societal transformation. They should look into methodologies that measure the impact of technologies on society by addressing issues of: what can be**
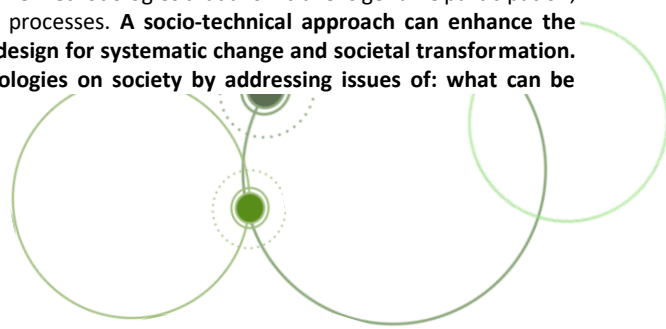
measured (qualitative and quantitative measurements); why it is important to measure; what is important to measure both from policy and technology aspects and how societal impact can be measured (qualitative and quantitative measurements), including evidence about cognitive biases.

Proposals should also address mitigation measures that could be taken to reduce the impact on privacy, human rights and fundamental freedoms with the involvement of citizens as codesigners and beneficiaries in security research. When assessing impact, attention should also be paid to citizens' training for reducing negative effects, modelling and simulation of their behaviour in the event of security threats. This may include virtual assessment of different protection (prevention, preparedness and response) measures. **Proposals' consortia should comprehend security practitioners, system developers, public sector, technology and civil society organisations, communication specialists on security research, researchers and Social Sciences and Humanities Experts from a variety of EU Member States and Associated Countries. In order to ensure a meaningful democratic oversight of the EU's security research programme, projects and policies at national and European level, proposals should ensure a multidisciplinary approach and have the appropriate balance of industry, citizens' representatives and social sciences and humanities experts**. Project proposals' consortia are encouraged to cooperate closely with the Networks of Practitioners funded under H2020 Secure Societies work programmes if valuable results on impact can be obtained, as well as with the Knowledge Networks for Research and Innovation in Security funded under the Horizon Europe Cluster 3 Work Programme. As indicated in the introduction of this call, proposals should foresee resources for clustering activities with other successful proposals in the same or other calls to identify synergies and best practices.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Proposals could also be linked to finished or ongoing projects such as the NewHoRRizon (under the H2020 Research and Innovation Programme) which have developed Societal Readiness Level Tools. They may also consider using their interactive web tools provided to help study the societal input and engagement as part of project proposal development and implementation. The project should have a maximum estimated duration of 4 years.

Type of action	Research and Innovation Actions
Deadline	**23 November 2022**
Expected EU contribution per project	EUR 2.00 million
Topic information	Link
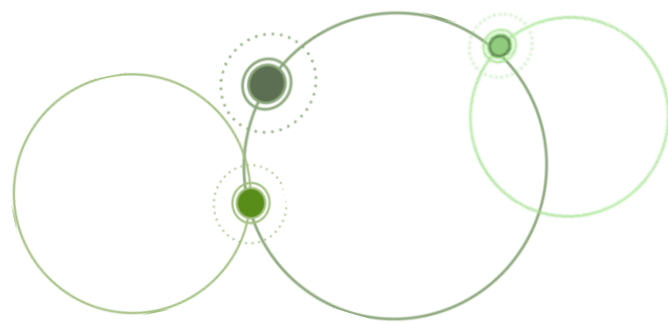
HORIZON-CL3-2022-SSRI-01-02: Knowledge Networks for security Research & Innovation

Expected Outcome

Projects are expected to contribute to all of the following expected outcomes:

- Enhanced analytical capacity to support the programming of EU-funded security research and capacity building funds through a periodic and timely evidence-based policy feedback;
- Periodically aggregated and consolidated view of the capability needs and gaps in the thematic areas under consideration;
- Periodically aggregated and consolidated view of the state-of-the-art technologies, techniques, methods and tools that can contribute to fill the identified capability gaps;
- Periodically aggregated and consolidated view of outcomes (including on technological, industrial, legal and ethical issues), future trends, lessons learnt and best practices derived from past and current security research effort incurred in the thematic areas under consideration.
- More systematic assessment and validation of the outcomes of EU-funded security research projects with respect to identified capability gaps through harmonised support mechanisms;
- Common and updated map of opportunities and constraints for the exploitation of EU security research and innovation projects, with special focus on industrialisation, commercialisation, adoption and deployment of innovative solutions in response to common capability gaps;
- Common and updated map of areas requiring standardised solutions and/or certification schemes to foster innovation uptake and market creation, as well as trainings and options for the implementation of such schemes.
- Enhanced cooperation between research institutions, smaller private research agencies, security practitioners, SMEs and community representatives to support integrated participation in requirements determination and analysis, research and validation and evaluation of results.

Scope

Innovation uptake is not a linear process, and even less a single-step process that happens only at the end of a research project and it is not automatically enabled by a successful research result. The innovation uptake process begins with the identification of a need and ends with an innovative solution deployed on the field of operations, being R&I only one of the many contributors to the overall process, but not the first and not the last. In other words, successful results of research projects are a necessary but not sufficient condition to guarantee the uptake of innovation. Investment in security research needs to be designed taking into consideration how and when it can deliver outcomes that contribute to the development of security capabilities. Therefore, research needs to be undertaken, from its very early stages, in a way that addresses real needs while guaranteeing the impact in the final solutions. It should also ensure to identify and underpin the factors that could help in the implementation of its results. However, the programming of research is highly conditioned by the quality, reliability and timeliness of the evidence that supports its decision making process. This includes the identification and understanding of the contextual elements that can or will influence or be influenced by the research (process), the research team and the research projects themselves. The European Commission and the EU Member States carry out this programming exercise periodically, taking into account a wide variety of inputs. The complexity of the challenge is notable, considering that the EU security landscape is volatile, uncertain, complex and ambiguous in what regards the security threats, the capabilities required to face them, the evolution of modern technologies, and the skillset needed to deploy those. In order to carry out a sound programming exercise, the European Commission and the EU Member States strive to consult and involve all actors. With that aim, experts are gathered in different configurations and their inputs are coordinated at EU and national levels to be factored in by the decision-making bodies of EU-funded security research. These experts require high quality, reliable and timely evidence to support their assessments, but information is often scattered, hardly visible and requires bespoke processing for the detection of patterns and for the generation of actionable intelligence. In other cases, it is simply not presented in the right format to unveil its value. Applicants are invited to submit proposals for the establishment of Knowledge Networks for Security Research & Innovation. The role of these networks is to collect, aggregate, process, disseminate and exploit the existing knowledge to directly contribute to the expected outcomes of this topic. Networks must engage with the main sources of information in order to have a sound and updated picture of the aspects mentioned above. This includes interaction with security experts (beyond the members of the project consortium), organisations, projects or initiatives, but also an extensive review of available databases, studies, reports or literature (notably all information generated under the EU-funded security research programmes, and possibly under other EU or MS funding programmes).

The networks have to ensure the dissemination and exploitation of their findings to the different communities of the security research ecosystem, including policy makers, security authorities, industry, researchers and citizens. Special emphasis needs to be made on the contribution of these networks to the work of entities and initiatives established by the European Commission and the EU Agencies (e.g. Union Civil Protection Knowledge Network) to contribute to the security research programming effort. In this regard, the networks have to contribute timely and intensively to the work of the Thematic Working Groups of the Community of Users for Secure, Safe and Resilient Societies (future CERIS – Community of European Research and Innovation for Security) and of other equivalent innovation labs/groups set-up by EU Agencies (e.g. EUROPOL). The networks will have to contribute to these working groups with the quantitative and qualitative evidence required to carry out their activities in support to a more impactful EU-funded Security R&I and to a more frequent and systematic innovation uptake. Each proposal should include a plan, and a budget amounting at least 25% of the total cost of the action to interact with industry, academia and other providers of innovative solutions outside the consortium, with a view to assessing the feasibility of their findings, give support in validation processes, promote competitive development (e.g. via prizes) or dissemination of results, among other options. The networks must be in a position to deliver findings on the abovementioned challenges starting from the month 6 of the project
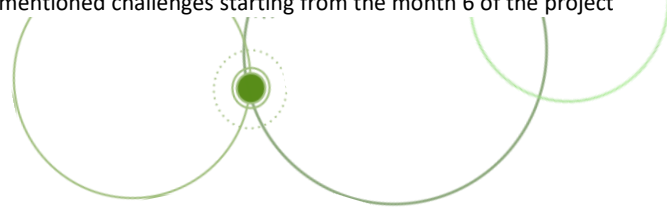
and periodically every 6 months or less, in accordance with the information needs of the entities and initiatives they are contributing to. Proposals should clearly describe the process and timing for the collection of inputs and the generation of outcomes. This plan should go beyond the description of project deliverables and milestones, and describe in detail how and when the findings will be disseminated and exploited during the project and in collaboration with the communities described above. The consortia submitting the proposals should ensure sufficient representativeness of the communities of interest (including, but not only, geographical representativeness) and a balanced coverage in terms of knowledge and skills of the different knowledge domains required to face the challenge, including security operations, technologies, research & innovation, industry, market, etc. The applying consortia should demonstrate how the project beneficiaries guarantee the expertise required to steer the project activities in all the knowledge domains to ensure the success of the action. The work of the partners should be supported by solid and recognised tools and methods, also accompanied by the required expertise to put them in practice. The networks should build to the extent possible on the work initiated by the Networks of Practitioners funded under H2020 Secure Societies work programmes. Should such networks be still ongoing, maximum cooperation and minimum overlapping should be ensured and demonstrated.

Under this call, the applicants are invited to propose networks on the thematic areas of:

Option A: Disaster Resilience

Option B: Fighting Crime and Terrorism.

The project should have a maximum estimated duration of 3 years.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Type of action	Coordination and Support Actions
Deadline	**23 November 2022**
Expected EU contribution per project	EUR 2.00 million
Topic information	Link

HORIZON-CL3-2022-SSRI-01-04: Social innovations as enablers of security solutions and increased security perception

Expected Outcome

Projects' results are expected to contribute to one or several of the following outcomes:

- **Policy makers, security practitioners and researchers have increased understanding of the capabilities and capacities of local communities and citizens to contribute to developing security solutions**;
- Policy makers, researchers and system developers increase the orientation of security solution development towards socially innovative and Responsible Research and Innovation approaches;
- **The notions of 'smart citizens' and 'smart local communities' empowered by Responsible Research and Innovation and social innovation, where the general public co-control safety and security of their environments, are more widely adopted by decision makers**;
- New benchmarks, standards or other quality criteria are established for developing security solutions through Responsible Research and Innovation;
- Increased collaboration across all parts of the quadruple helix (academia/research, public authorities, industry/SMEs, civil society/citizens/local communities) to develop innovations in line with the needs, values and expectations of society;
- Innovative, transferable and potentially scalable technological solutions co-created with citizens and local communities in social labs and innovation living hubs, and citizens empowered to act as generators, validators and end-users of the new horizontal technologies;
- Societal trust in security research products, their desired usefulness and social acceptability.

Scope

Citizens and local communities are insufficiently involved in the co-creation of socially innovative processes to develop security solutions and thus conceptions of what citizens and local communities know and think about security could be predominantly shaped by media coverage. This might result in bias in the assessment of the seriousness and probability of different security threats. Nevertheless, social acceptance of security technology depends on understanding citizens' awareness of security problems and threats. Comprehensive discussion that involves citizens from all parts of society directly in co-design such as through Responsible Research and Innovation and social innovation, alongside other security technology actors, would integrate public concerns beyond incident-based interpretations of security threats, thereby increasing social acceptance of security technology and subjective feelings and perceptions of personal security in daily life. At the same time, industry would be in a position to identify new business opportunities in producing and delivering security products and services, which are in line with needs, values and expectations of citizens and local communities and support their well-being. Social innovations for increasing security and security perception can be manifold and the scope of application of social innovation is potentially wide-ranging and can address diverse aspects. For example, apps that help citizens to prevent, detect and respond with first responders in disaster and crisis situation and to access real-time information about adequate responses; the formation of networks of parents of children who are considered susceptible to extreme ideologies to establish early warning and early-intervention mechanisms. What these examples have in common is that they give citizens an active role in co-creation and produce a practical use value. Giving more emphasis on a co-creation procedure from the design phase could also overcome the corresponding lack of knowledge about how socially innovative solutions can contribute to increased security and security perception. Although citizens and local communities can successfully support as co-designers and beneficiaries to replicate and upscale best practices as well as systemic and cross-sectorial solutions that combine technological, digital, social and nature-based innovation, existing knowledge of such contributions is limited. **Therefore, proposals should develop a societal development plan that builds upon a people-centred approach and examines how social innovations on security are organised, how they work, how and why they are adopted or rejected, their direct and indirect benefits and costs, including in vulnerability assessments, how they sustain, and which interfaces with other more formal security agents are established**.

Proposals should map and analyse a social innovation in one or more distinct social spheres, in areas such as:

(a) Security disturbance at large (pop-) cultural and sports events;

(b) Security and security behaviour in public places, public transport or mobility;

(c) Radicalisation, dis-integration in local communities and social media;

(d) Digital identity, data portability and data minimisation with an attribute based society in control; (e) Safety and security in remote communication, command and control of operation in risk scenarios;

(f) Mobilisation on human trafficking;

(g) Automatic detections' use.

Proposals should consider the social relevance of research, social marketing, transferability and scaling of such social innovations as this is an area where there is limited research and experimentation, which could help to spread the use of such solutions. **They should also consider education, training and change individual behavioural and social practices by involving citizens and local communities as generators, validators and end-users of the new horizontal/advanced technologies**. Proposals which have developed innovative ideas on societal resilience under the Destination Disaster-Resilient Society and which can transform them into social innovations for disaster crisis situations engaging citizens and local communities are not pre-empted to participate in this topic. **Consortia should give meaningful roles to all research and innovation actors, including security practitioners, system developers, the public sector, technology development organisations, civil society organisations, communication specialists on security research, researchers and Social Sciences and Humanities Experts from a variety of EU**

Member States and Associated Countries. In order to ensure a meaningful democratic oversight of the EU's security research programme, projects and policies at national and European level, proposals should establish a multidisciplinary approach and have the appropriate balance of industry, representatives of citizens and local communities and social sciences and humanities experts.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

As indicated in the introduction of this call, project proposals should foresee resources for clustering activities with other successful proposals in the same or other calls, to find synergies, and identify best practices, and to develop close working relationships with other Programmes (e.g. the Civil Society Empowerment Programme (CSEP-ISF), Science with and for Society (SwafS), the Digital Europe Programme). The project should have a maximum estimated duration of 4 years.

Type of action	Research and Innovation Actions
Deadline	**23 November 2022**
Expected EU contribution per project	EUR 2.00 million
Topic information	Link
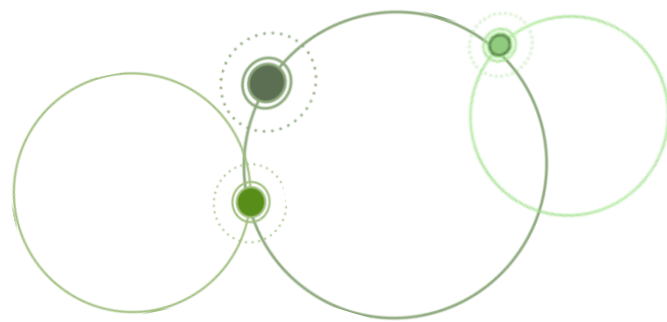
Cluster 4

Digital, industry and space

Call – A human-centred and ethical development of digital and industrial technologies

HORIZON-CL4-2022-HUMAN-01-01: AI for human empowerment (AI, Data and Robotics Partnership)

Expected Outcome

Proposal results are expected to contribute to at least one of the following expected outcomes:

- Truly mixed human-AI initiatives for human empowerment
- Trustworthy hybrid decision-support systems

Scope

Build the next level of perception, visualisation, interaction and collaboration between humans and AI systems working together as partners to achieve common goals, sharing mutual understanding and learning of each other's abilities and respective roles. Innovative and promising approaches are encouraged, including human-in the loop approaches for truly mixed human-AI initiatives combining the best of human and machine knowledge and capabilities, tacit knowledge extraction (to design the next generation AI-driven co-creation and collaboration tools embodied e.g. in industrial/working spaces environments). Each proposal will focus on one of the two following research objectives, and clearly identify it:

1. Reach truly mixed human-AI initiatives for human empowerment. The approaches should combine the best of human and machine knowledge and capabilities including shared and sliding autonomy in interaction, addressing reactivity, and fluidity of interaction and making systems transparent, fair and intuitive to use, which will play a key role in acceptance. The systems should adapt to the user rather than the opposite, based on analysis, understanding and anticipation about human behaviour and expectations.

2. Trustworthy hybrid decision-support, including approaches for mixed and sliding decision-making, for context interpretation, for dealing with uncertainty, transparent anticipation, reliability, human-centric planning and decision-making, interdependencies, and augmented decision-making. Transparency, fairness, technical accuracy and robustness will be the key, together with validation strategies assessing also the quality of the decision of the AI supported socio-technical system.

All proposals should adopt a human-centred development of trustworthy AI and investigate and optimise ways of human-AI interaction, key for acceptance and democratisation of AI, to allow any user to take full advantage of the huge benefits such technology can offer, regardless of their age, race, gender or capabilities. This includes development of methods to improve transparency, in particular for human users, in terms of explainability, expected levels of performance which are guaranteed/verifiable and corresponding confidence levels, accountability and responsibility, as well as perceived trust and fairness. AI could also be used to empower humans in supporting them to improve responsible behaviours, where appropriate, but this should be done in full respect of the requirements ensuring trustworthy AI, including human autonomy. **Innovative scientific approach towards human-centric approaches will require multidisciplinary and trans-disciplinary approaches paying particular attention to intersectional factors (gender, ethnicity, age, socioeconomic status, disability) including SSH and other disciplines relevant to stimulate novel research avenues, and eventually improve user-acceptance.** Collaborative design and evaluation with users involvement should also be considered. As a pilot activity, proposals in this topic will dedicate part of their activities on investigating novel ways of engagement by citizens or citizen representatives with AI development, with a view of optimising experience towards improving usability and experience for citizens (both at professional or daily life environment). All proposals should contribute to build the next level of perception, visualisation, interaction and collaboration, and understanding between humans and AI systems working together as partners to achieve common goals, sharing mutual understanding of each other's abilities and respective roles. All proposals are expected to embed mechanisms to assess and demonstrate progress (with qualitative and quantitative KPIs, benchmarking and progress monitoring, as well as illustrative application use-cases demonstrating concrete potential added value), and share results with the European R&D community, through the AI-on-demand platform, a public community resource, to maximise re-use of results, either by developers, or for uptake, and optimise efficiency of funding. Activities are expected to achieve TRL 4-5 by the end of the project. This topic implements the co-programmed European Partnership on AI, Data and Robotics. All proposals are expected to allocate tasks to cohesion activities with the PPP on AI, Data and Robotics and funded actions related to this partnership, including the CSA HORIZON-CL4-2021-HUMAN-01-02.

Type of action	Research and Innovation action
Deadline	**05 April 2022**
Expected EU contribution per project	EUR 4.00 million
Topic information	Link
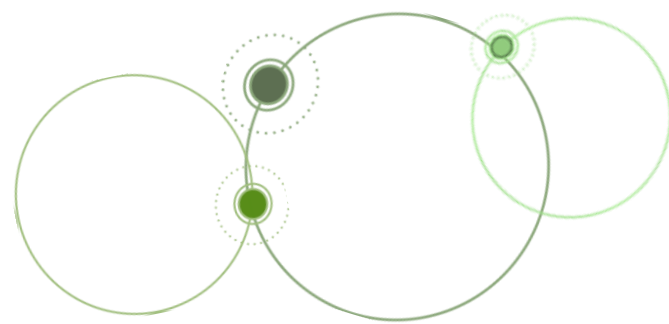
Call – A human-centred and ethical development of digital and industrial technologies

HORIZON-CL4-2022-HUMAN-01-02: European Network of AI Excellence Centres: Expanding the European AI lighthouse

<u>Expected outcome</u>
Proposals results are expected to contribute to all the following expected outcomes:
- Scientific progress in AI, addressing major challenges hampering its deployment.
- Establishing a new pillars of the European AI lighthouse
- Reinforcing the leading unified European AI community

<u>Scope</u>
To ensure European open strategic autonomy in critical technology such as AI, with huge potential socio-economic impact, it is essential to reinforce and build on Europe's assets in such technologies, including its world-class researcher community, in order to stay at the forefront of technological developments. As stated in the communication from the European Commission on Artificial Intelligence for Europe and the coordinated action plan between the European Commission and the Member States, while Europe has undeniable strengths with its many leading research centres, efforts are scattered. Therefore joining forces will be crucial to be competitive at international level. Europe has to scale up existing research capacities and reach a critical mass through tighter networks of European AI excellence centres. The proposals should develop mechanisms to reinforce and network excellence centres in AI, bringing the best scientists from academia and industry to join forces in addressing the major AI challenges hampering its deployment, and to reinforce excellence in AI throughout Europe via a tight network of collaboration. Such networks are expected to mobilise researchers to collaborate on key AI topics and to increase the impact of the funding in progressing faster in joined efforts rather than working in isolation, with fragmented and duplicated efforts. Such networks, together with other mechanisms, will play an important role in reaching critical mass and in overcoming the present fragmentation of AI research in Europe.

Proposals will mobilise the best European teams in AI community to join forces to address major technical as well as sector- or societal-driven challenges: strengthening excellence, networking, multidisciplinarity, academia-industry synergies. This initiative contributes to the initiative started in H2020 to develop a vibrant European network of AI excellence centres, and a vibrant AI scientific community, and continued in the first call of Horizon Europe. To complement and extend this initiative the proposals should create a network of excellence for the following topics:

1. Next Generation AI – covering foundational research and emerging and novel approaches, with a view of improving the technical performances of AI-based systems, such as increased accuracy, robustness, verifiability, dependability, adaptability, versatility, graceful degradation, etc. Research is also expected to address functional and performance guarantees. Aspects to be covered include, but are not limited to: foundational research in artificial intelligence and machine learning including new paradigms, algorithms, architectures and novel optimization and regularization methods, hybrid AI, hybrid machine learning, data/sample –efficiency.

2. Scientific research and technologies prioritised in the latest SRIDA (Strategic Research, Innovation and Deployment Agenda of the AI, Data and Robotics PPP) , and complementing the previously selected Networks of Excellence centres (either in H2020-ICT48, or the first calls for Networks of Excellence Centres in Horizon Europe).
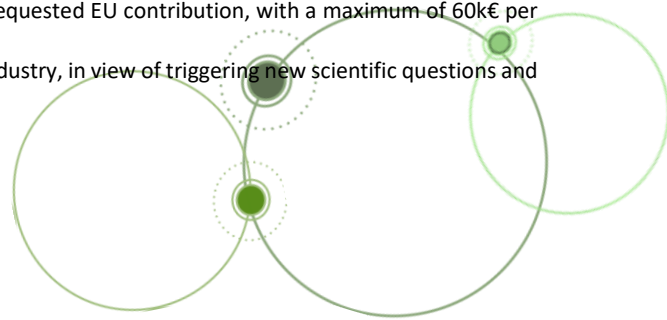
The selected proposals will maximise the coverage of the portfolio of networks of excellence centres in AI.

Composition of the Networks:
- Proposals should be driven by leading researchers in AI and AI relevant technologies from major excellent AI research centres, and bringing the best scientists across Europe, including also from promising research labs. **They will bring on board the necessary level of expertise and variety of disciplines and profiles to achieve their objectives, ensuring a multidisciplinarity and multi-sectorial research approach, while respecting equality and diversity among the attracted talents.**

Activities of the Networks:
- In order to structure the activities, the proposals will focus on important scientific or technological challenges with industrial and societal relevance where Europe will make a difference, by building on strengths, or strengthening knowledge to fill gaps critical for Europe.
- Based on the identified challenges, the proposals will develop and implement common research agendas. The main vision and roadmap with targets within the projects, as well as methodology to implement and monitor progress will have to be specified in the proposal and can be further developed during the project.
- Scientific progress will have to be demonstrated through testing on application specific datasets or use-cases. By extending the benchmarking of foundational research to application specific areas, the research community will simultaneously address advancements in AI and grand societal and technological challenges.
- The proposals should define mechanisms to foster excellence throughout Europe, to increase efficiency of collaboration, including through networking and exchange programmes, and to develop a vibrant AI network in Europe.
- Each network will disseminate the latest and most advanced knowledge to all the academic and industrial AI laboratories in Europe and involving them in collaborative projects/exchange programmes. (This could involve projects defined initially or via financial support to third parties, for maximum 20% of the requested EU contribution, with a maximum of 60k€ per third party).
- Each network will develop, where relevant, interactions with the industry, in view of triggering new scientific questions and fostering take-up of scientific advances

- Each network will develop collaboration with the relevant Digital innovation Hubs and AI start-up initiatives, to disseminate knowledge and tools, and understand their needs.
- These networks should also foster innovation and include mechanisms to exploit new ideas coming out of the network's work (for instance via incubators).
- Overall, each proposal will define mechanisms to become a virtual centre of excellence, offering access to knowledge and serve as a reference in their chosen specific field, including activities to ensure visibility.

The proposals should

- include mechanisms to spread the latest and most advanced knowledge to all the AI-labs in Europe
- develop synergies and cross-fertilization between industry, academia and civil society.
- become a common resource and shared facility, as a virtual laboratory offering access to knowledge and expertise and attracting talents
- provide broad access to AI excellence in Europe and also play an important role in increasing visibility
- provide access to the required resources and infrastructure to support the R&D activities of the action, such as cloud and computing capacity, IoT, robotics equipment, support staff and engineers, where relevant, and the capacity to develop prototypes, pilots, demonstrators, etc.
- include a number of major scientific and application challenges which will mobilise the community to join forces in addressing them. Continuous evaluation and demonstration of scientific and technological progress (with qualitative and quantitative KPIs, benchmarking and progress monitoring processes) towards solving the targeted challenges will motivate the entire network and support publications and scientific career developments (providing reference benchmarks to publish comparative results, using the reference data, scenarios, etc.), and also showcase the technology in application contexts, to attract more user industries and eventually foster take up and adoption of the technology.
- include mechanisms to share resources, knowledge, tools, modules, software, results, expertise, and make equipment/infrastructure available to scientists to optimise the scientific and technological progress. To that end, proposals should exploit tools such as the AI-on-demand platform and further develop and expand the platform, to support the network and sharing of resource, results, tools among the scientific community, maximising re-use of results, and supporting faster progress. Mechanisms to test results and continuously measure and demonstrate progress should be integrated in the platform, which is also important to support the scientific community, allowing also for comparative analysis. Openness and interoperability of components are encouraged to develop synergies and cross-fertilization between different approaches and solutions (e.g. through modularity of components or open interfaces)
- include collaboration mechanisms among the best AI and AI-relevant research teams, but also mechanisms to bring all European AI teams to the highest level of excellence. This is also in view of supporting and encouraging the adoption of AI technologies in all Member States and Associated Countries, with particular emphasis on geographical aspect and elimination of gaps between Member States/Associated Countries, as well as addressing existing gender disparities.
- exploit and develop technology enablers, such as methodologies, tools and systems and exploit latest hardware development and data spaces, cloud and HPC resources.

These networks will also address a number of sector- or societally-driven challenges, mobilising the community towards achieving common goals in addressing such challenge that AI can help solving, demonstrating the potential positive impact on the society, economy and environment. Activities are expected to achieve TRL 4-5 by the end of the project.

Proposals are expected to develop synergies:

- With other Networks of excellence centres in AI funded in H2020 or Horizon Europe, with a view of, all together, create vibrant European network of AI excellence centres. To that end, the activities should integrate with and complement the activities of the H2020-ICT-48 projects. The proposals are expected to dedicate tasks to ensure this coherence.
- With relevant activities in AI, Data and Robotics, primarily in destinations 3, 4 and 6, but also in other destinations and clusters (in particular with cluster 3 regarding security-related activities), and share or exploit results where appropriate.

All proposals are expected to allocate tasks to cohesion activities with the PPP on AI, Data and Robotics and funded actions related to this partnership, including the CSA HORIZONCL4-2021-HUMAN-01-02. Background The selected network(s) of excellence centres will contribute to the larger objective of the European Commission to establish the European AI lighthouse. The AI lighthouse is expected to mobilise the AI community to collaborate on key AI research challenges and to progress faster in joined efforts rather than working in silos, leading to fragmented and duplicated efforts. This is essential to reach critical mass and overcome the present fragmentation of AI research in Europe. The lighthouse will bring together stakeholders from research, innovation and deployment, to become a world reference in AI that can attract investments and the best talents in the field. The lighthouse will build on key pillars, each of them being a network of excellence centres specialising in a given topic where Europe has the potential to become a global champion.

Type of action	Research and Innovation action
Deadline	**05 April 2022**
Expected EU contribution per project	EUR 11.50 million
Topic information	Link
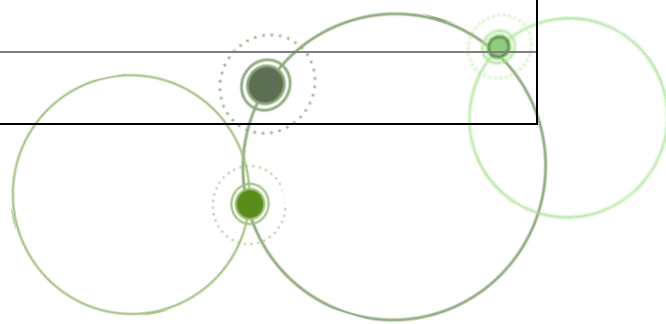
Call – A human-centred and ethical development of digital and industrial technologies

HORIZON-CL4-2022-HUMAN-01-14: eXtended Reality Technologies

<u>Expected Outcome</u>
Proposals are expected to contribute to the following outcomes:
- Innovative eXtended Reality industrial and societal applications, integrating technologies such as advanced visualisation, 3D, Augmented and Virtual Reality experiences, human-machine interaction and cooperation, with a focus on well designed and fully tested scenarios in real-world environment.

<u>Scope</u>
The emergence of smart cities and factories, autonomous vehicles and homes, intelligent appliances in conjunction with Virtual and Augmented Reality applications are opening new ways to live, work, care, learn, play and socialize. Whilst people, places and objects are being digitized and transferred into the virtual world and placed spatially and contextually, sensors are embedded into our environments and the objects around us. New digital interaction technologies are playing an essential role in this transformation by enabling us to interact naturally and intuitively with digital information in the physical world.

This topic asks for research and innovation proposals to develop and demonstrate novel eXtended Reality technologies, combining human-machine interactions and real, mixed, augmented and virtual environments, aiming to augment the capabilities of users and machines and to provide seamless and persistent physical-digital experiences, while guaranteeing the privacy and rights of individuals and companies and ensuring safe, secure and trustworthy interactions. **Special attention will be given to including end-users and transdisciplinary research including social sciences and humanities, in order to deliver and enhance uptake of suitable, ethical and safe solutions**.

Proposals should cover at least one of the following points and will provide well designed and fully tested scenarios in real-world environment for enhanced eXtended Reality experiences:
- devising innovative digital interfaces that take advantage of spatial computing to allow users to interact with real-time contextual information activated by intuitive sensory triggers;
- developing novel multi-user virtual communication and collaboration solutions that provide coherent multisensory experiences and optimally convey relevant social cues;
- improving the resilience, robustness, accuracy and semantic understanding of the current mapping and positioning systems, while providing real-time bidirectional synchronisation between models and interactive applications;
- facilitating the exploitation of 3D data acquisition techniques, enhancing its performance while reducing technology costs and providing efficient and scalable encoding, processing, storage and rendering means;
- enabling the construction of compelling context-aware and embodied experiences by providing solutions for the creation of convincing digital avatars and agents, with natural looking and physically realistic behaviours, movements and expressions.

Type of action	Research and Innovation action
Deadline	**05 April 2022**
Expected EU contribution per project	Between EUR 5.00 and 8.00 million
Topic information	**Link**
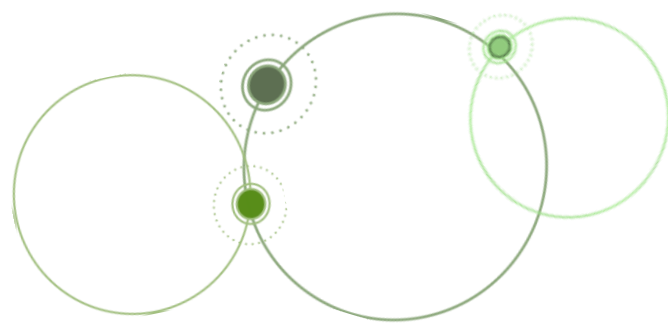
Call – A human-centred and ethical development of digital and industrial technologies

HORIZON-CL4-2022-HUMAN-01-19: eXtended Reality Learning - Engage and Interact

Expected Outcome

Proposals are expected to contribute to the following outcomes:

- To develop innovative eXtended Reality applications for learning, training and education To test and support take-up of proven, successful eXtended Reality tools, making Europe a leader in cutting-edge technologies for education.

Scope

eXtended Reality, combining human-machine interactions with real, mix, augmented and virtual environments, allows for higher engagement with teaching material and more efficient interaction with complex problems or new environments.

Proposals will make use of XR technologies to develop and test virtual tools for teaching and learning. The selected proposal will create a European reference platform on learning and teaching with XR with the aim to:

- **develop, apply and test the use of eXtended Reality technologies, in education, such as for virtual field trips, content creation and exploration (STEM, history, etc.), awareness of climate changes and biodiversity challenges, training of young professionals and upskilling** (such as but not limited to healthcare and medical, manufacturing, construction and engineering), distance and blended learning, accessibility and inclusion;
- provide access to teachers, students, parents and school administration to a reference platform where they can find educational solutions appropriate for their educational needs;
- build a focal point where the EdTech and XR community (including SMEs, start-ups, companies, academia/research community, learning and instructional designers, social innovators) can share/market their existing digital educational XR solutions, including those developed in the context of EU funded projects;
- further support digital start-ups, SMEs and industry active in the sector through Financial Support for Third Parties actions allowing them to further advance early prototypes of XR educational solution to a market-ready product, with the overall aim to populate the on-demand education platform;
- build upon and link to existing relevant initiatives, including for instance existing platforms, catalogues or repositories;
- reach out to potential user groups through awareness-raising and communication activities to boost the use of the platforms.

The project will be populated with FSTPs and smaller projects such as:

- FSTP projects for fully developed, tested and ready-to-deploy digital learning solutions/apps using XR;
- FSTP XR for education projects including Mini-Piloting projects/schools to be used for user-tests/examples/communication

The actions should select these small scale projects through the use of financial support to third parties. A minimum of 60% of the EU funding of the action should be allocated to the financial support of these third parties, typically of the size of EUR 150 000 to 300 000 per third party and a duration of about 9 to 12 months. Financial support to third parties should in line with the conditions set out in the General Annexes. In order to facilitate the integration with existing IT systems and policies, the EU XR platform for education should only accept XR content, tools and solutions based on open standards, such as OpenXR and WebXR and should offer publicly available access to XR content, tools and solutions, without passing through app stores.

Type of action	Innovation action
Deadline	**05 April 2022**
Expected EU contribution per project	Between EUR 5.00 and 8.00 million
Topic information	Link
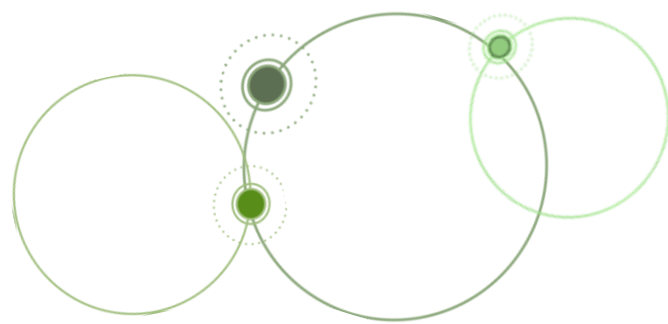
Topics with minor SSH relevance

HORIZON-CL4-2022-HUMAN-01-05: Next Generation Safer Internet: Technologies to identify digital Child Sexual Abuse Material (CSAM)

Link
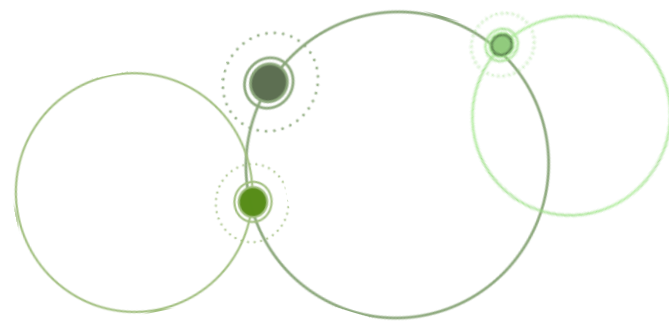
HORIZON-CL4-2022-TWIN-TRANSITION-01-02: Products with complex functional surfaces (Made in Europe Partnership)

Expected outcome

Projects are expected to contribute to the following outcomes:

- Develop more efficient manufacturing processes to increase market share increase for products with functional surfaces that contribute to competitiveness and a transition to green and sustainable production flows;
- Significant reduction of the environmental footprint for surface treatments;
- Uptake of treatment technologies in applications for a sustainable society, targeting reductions in energy use and environmental footprint.
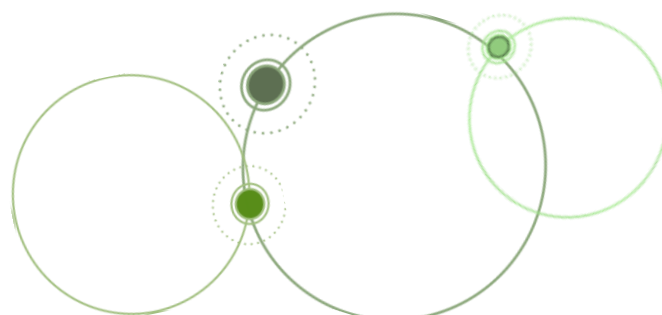
Scope

Surface treatments are an integral part of any manufacturing process. Surface treatments include many disciplines, such as painting/coating/printing (spray, powder, dip coating, inkjet etc.), plating/implantation (electroplating, vacuum plating/coating, etc.), thermal treatments (annealing, thermo-chemical processes, etc.), laser-based treatments (annealing, texturing, etc.), additive manufacturing, micro manufacturing (micro electrical discharge machining, micro milling, etc.) chemical and electrochemical treatments (anodizing, electropolishing, chemical deposition, etc.), biochemical treatments, etching (wet etching, plasma/dry etching, also for texturing). While the integration of these treatment technologies into a manufacturing line has been well reported, the technologies as such need to be adapted for each particular profile. In addition, with progressively more complex and customised requirements on shape, material and functionality, the demands on efficient and flexible surface treatments are increasing. In a transition towards a sustainable production, with a substantially lower environmental footprint, the demands are even higher. The projects under this topic should address the following:

- Develop new surface treatments specifically targeting and enabling end-products with the purpose of reducing the end-products' energy usage and/or environmental footprint. This may include co-design of product geometry and surface properties;
- Use of innovative production technologies for further functional integration and miniaturisation in order to reduce environmental footprints and resource use of products;
- Integrate the new surface treatments in a manufacturing line for profiles with complex shape or multimaterial content, with clear metrics on its efficiency during operation;
- Develop new business models and strategies for the uptake of these new technologies and with clear objectives on how to expand the uptake to other sectors and other applications.

Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction to this Destination. Research must build on existing standards or contribute to standardisation. Interoperability for data sharing should be addressed. **Additionally, a strategy for skills development should be presented, associating social partners when relevant.** All projects should build on or seek collaboration with existing projects and develop synergies with other relevant European, national or regional initiatives, funding programmes and platforms. This topic implements the co-programmed European Partnership Made in Europe.

Type of action	Research and Innovation action
Deadline	**30 March 2022**
Expected EU contribution per project	Between EUR 4.00 and 6.00 million
Topic information	**Link**

Call – **Climate neutral, circular and digitized production**

HORIZON-CL4-2022-TWIN-TRANSITION-01-03: Excellence in distributed control and modular manufacturing (Made in Europe Partnership)

Expected Outcome

Projects are expected to contribute to the following outcomes:

- Significant advance in modular technologies for flexible manufacturing operations, which respond to disrupted supply chains, or rapid changes in customer **and societal demands**;
- Transition of modular technology to sustainable production for varying batch sizes, including single lots, with a clear integration of control and decision-making strategies at different levels and throughout the supply chain;
- Improved understanding among industrial users, including SMEs, of how to organise and control reconfigurable manufacturing systems built from modules with defined interfaces, including quality assessments, environmental impact, energy use, end-user involvement and business models.
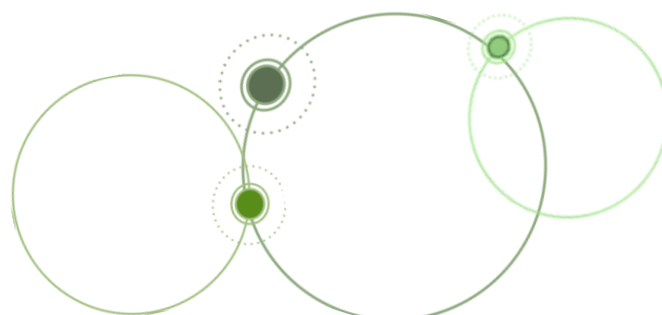
Scope

Modularity of a production system is crucial for flexibility and to allow for varying the production according to needs and circumstances by introducing, changing, and removing different process steps. While the concept of modularity is not new, there is still a vast range of production steps that cannot be considered modular, and the ones that can be considered as such are not necessarily suitable for current demands nor to be considered as a part of sustainable production regimes.

The projects under this topic need to address the following aspects:

- Propose and develop new production modules that cover processes that are not currently readily available on the market and go beyond the current state of the art with a clear alignment of customer and workers' needs including taking into consideration biases and gender dimension;
- Create interfaces based on open-source protocols that allow for easily integration of modules in existing lines and with other modules or production elements;
- Create industrial strategies on how to use modularity, including its related service models, to reduce energy consumption and environmental footprint, and demonstrate these in a relevant environment;
- Develop business models that demonstrate the potential of the modular technologies to be transferred from one specific manufacturing sector to several others;
- Support training and knowledge transfer to relevant parts of the workforce.

Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction to this Destination. Research must build on existing standards or contribute to standardisation. Interoperability for data sharing should be addressed**. Additionally, a strategy for skills development should be presented, associating social partners when relevant.** All projects should build on or seek collaboration with existing projects and develop synergies with other relevant European, national or regional initiatives, funding programmes and platforms. This topic implements the co-programmed European Partnership Made in Europe.

Type of action	Research and Innovation action
Deadline	**30 March 2022**
Expected EU contribution per project	Between EUR 4.00 and 6.00 million
Topic information	**Link**

Call – Climate neutral, circular and digitized production

HORIZON-CL4-2022-TWIN-TRANSITION-01-04: Intelligent work piece handling in a full production line (Made in Europe Partnership)

Expected Outcome

Projects are expected to contribute to the following outcomes:

- Develop highly flexible, resilient, reconfigurable and agile production lines able to handle a variety of different products and materials with high precision;
- Deploy easy to program advanced control systems capable of intelligent handling of complex products in terms of shape, size, material and stiffness;
- Increase productivity by enabling fast and accurate movement of work pieces through the production line, ensuring just-in-time delivery and reducing downtime.

Scope

The global trends towards product customization have increased production complexity. To maintain global leadership and competitiveness of European manufacturing industry, there is a strong need for efficient, flexible, reconfigurable and data-driven agile factories. The recent pandemic crisis highlighted even further the need of manufacturing lines that can switch production within a matter of hours. Products and component handling is an integral part of the manufacturing industry and its optimization increases productivity while minimizing production costs and time. However, the increasing complexity and customization of products coupled to the paradigm shift towards circular economy requires new assembly and disassembly lines able to handle a high variety of work pieces which might be available as 3D models or just as physical artefacts. Therefore, there is an increasing demand for innovative smart automated handling systems. **Multidisciplinary research activities should include SSH and cover:**

- **Development of innovative, efficient and low consumption systems for storage, retrieval, conveying and pick-and-place using a multi-disciplinary approach** combining technologies such as collaborative/autonomous assembly and logistics, smart conveyor belts, advanced robotics, lightweight, flexible and versatile grippers, IoT, integrated physical and biochemical sensors (e.g. mechanical, magnetic, optical, electrochemical), image processing, simulation, modelling, data acquisition, data storage/sharing, data interoperability, data analytics, automated planning and machine learning;
- Development of advanced and robust handling devices and systems, for efficient manipulation and manufacturing process execution. Integrate advanced control of individual handling devices exploiting advances in AI;
- Achieve a high degree of flexibility and reconfigurability by ensuring interoperability and user-friendliness of both hardware and software;
- The solutions proposed should be able to handle autonomously different objects with a significant variety of shape, size and material properties;
- **Demonstrate benefits for workers by reducing their involvement in unsafe and unhealthy tasks, improving their working conditions and increasing trust and acceptance towards technology**;
- Deploy innovative technologies in at least three manufacturing lines targeting different manufacturing processes and sectors, e.g. food & beverage preparation and packaging, metalworking, product assembly, textile processing and production, etc.
-

Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction to this Destination. Research must build on existing standards or contribute to standardisation. Interoperability for data sharing should be addressed. Additionally, a strategy for skills development should be presented, associating social partners when relevant. All projects should build on or seek collaboration with existing projects and develop synergies with other relevant European, national or regional initiatives, funding programmes and platforms. In order to achieve the expected outcomes, international cooperation is encouraged, in particular with Japan or South Korea. This topic implements the co-programmed European Partnership Made in Europe.

Type of action	Research and Innovation action
Deadline	**30 March 2022**
Expected EU contribution per project	Between EUR 4.00 and 6.00 million
Topic information	Link

Call – **Climate neutral, circular and digitized production**
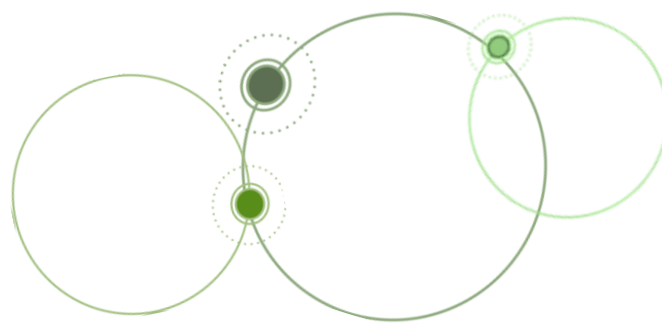
HORIZON-CL4-2022-TWIN-TRANSITION-01-06: ICT Innovation for Manufacturing Sustainability in SMEs (I4MS2) (Made in Europe Partnership)

<u>Expected outcome</u>
Projects are expected to contribute to the following outcomes:
- Making European manufacturing companies, especially SMEs and small mid-caps, more sustainable and resilient through the best use of digital technologies and upskilling of personnel;
- Making jobs of humans working in the manufacturing sector safer and more attractive for a diverse population of workers;
- Increasing innovation capacity, agility and productivity of the manufacturing sector, in particular for SMEs and mid-caps;
- Increasing the competitiveness of SMEs and mid-caps by reducing the entry barriers to the use of advanced digital technologies, and transferring innovative solutions into the wider manufacturing community.

<u>Scope</u>
ICT Innovation for Manufacturing SMEs (I4MS) aims to support manufacturing SMEs and mid-caps in adopting the latest innovative digital technologies for their business operations. I4MS2 builds on I4MS and addresses more significantly a sustainable and resilient production. The pandemic and economic crises demonstrated the key role of digital technologies in responding quickly to external changes. Digitalisation improves resilience, agility and competitiveness, and enables cost-efficient production in Europe. It will also support a radical reduction of the environmental footprint of the sector. In this context, experimentation with innovative and secure digital technologies in their production processes, products and business models guided notably by competence centres specialised in the technologies mentioned below will enhance manufacturing companies to successfully manage the twin digital and green transformation of the coming years. I4MS2 calls for Innovation Action projects that will support European SMEs and mid-caps to innovate and make more sustainable their products, production processes and business models through experimentation and testing. At least 50% of the budget should be allocated to SMEs and mid-caps to participate in the experiments. The proposals may include financial support to third parties to finance SMEs and mid-caps. Proposals should describe their complementarity to existing initiatives, namely the network of European Digital Innovation Hubs, which is supported through the Digital Europe Programme. They should also indicate how they will collaborate with European Digital Innovation Hubs.

**Priority should be given to technologies that can:**
- Improve the sustainability of processes and products; significantly reduce or reuse waste and lower the energy and carbon footprint;
- Make industrial processes more agile, secure and resilient to future changes;
- **Make manufacturing jobs more attractive for humans, whichever the age, gender or social and cultural background, through better human-machine interfaces and more intuitive interaction with digital tools;**

The following technology areas should be addressed in proposals:
- Artificial Intelligence applied to manufacturing, with a specific focus of AI applications at the edge;
- Cybersecure Industrial Internet of Things enabling trustworthy sharing of industrial data and value creation, to achieve further flexibility and agility of supply chains;
- Advanced interfaces and collaboration within smart working environments such as collaborative robots.

Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction to this Destination. Research must build on existing standards or contribute to standardisation. Interoperability for data sharing should be addressed. Additionally, a strategy for skills development should be presented, associating social partners when relevant. All projects should build on or seek collaboration with existing projects and develop synergies with other relevant European, national or regional initiatives, funding programmes and platforms. This topic implements the co-programmed European Partnership Made in Europe.

Type of action	Innovation action
Deadline	**30 March 2022**
Expected EU contribution per project	Between EUR 4.00 and 8.00 million
Topic information	**Link**
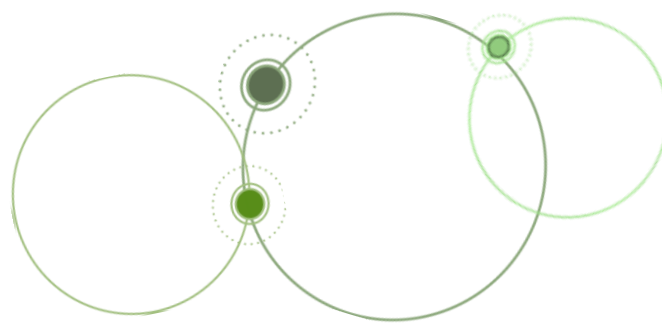
HORIZON-CL4-2022-TWIN-TRANSITION-01-10: Circular flows for solid waste in urban environment (Processes4Planet Partnership)

Expected outcome

Projects are expected to contribute to the following outcomes:

- Deploy the concept of Industrial-Urban Symbiosis (I-US) on a real scale demonstrator, making the flow of solid waste circular in process, manufacturing and/or construction industries;
- Reduce 80 % (in weight or volume) solid waste generated in comparison to current state-of-the art, by re-using, valorising and transforming waste, by-products and side-streams into new/secondary resources of raw materials;
- Plan actions (e.g. awareness of circularity potential) to overcome non-technological barriers for exploitation (i.e. waste regulations, standardisation, confidentiality and compliance, ownership, fair sharing of benefits, acceptance of the concept);
- Develop knowledge sharing: know-how, advantages, challenges and recommendations on technological and non-technological aspects (e.g. job profile optimisation) with the European Community of Practice (ECoP) and other relevant bodies, disseminating the major innovation outcomes to support the implementation of I-US;
- Explore and illustrate replication potential in other regions (e.g. by setting up a network amongst waste associations to optimise flow of secondary raw materials);
- Implement actions to facilitate relations and to involve the local community actors (authorities, associations, civil society, relevant businesses, especially SMEs, educational organisations, etc.), e.g. exchanging knowledge, training, human capital, contributing to the optimisation of job profiles and sharing with the local educational establishments and with the ECoP;
- Implement a social innovation spin-off action involving one of the local community actors. Relevant indicators and metrics, with baseline values, should be clearly stated in the proposal.

Scope

Hubs for circularity for solid waste in urban environment tackles a fundamental issue of end of life materials representing a huge amount and broad range of solid wastes. Solid waste are intended here as process industry, manufacturing industry, construction industry waste and solid urban waste (consumer waste, End-of-Life waste). Solid waste in general is one of the biggest waste streams in Europe, accounting for more than 30% of all waste generated in the EU (Dec.2019 data), re-using and re-cycling most of that could cut significantly the emissions caused by the mining and manufacturing needed to produce those materials in the first place and as such represents an important decarbonisation potential. There is a need of innovative solution engaging waste management actors in novel value chains to valorise a significant part of those wastes, bringing full attention to upcycling back to secondary materials instead of down cycling of low re-use.

Projects are expected to address:

- Management and processing of waste streams through e.g. collection, disassembly, sorting, purification, refining, concentration, processing (e.g. thermal, mechanical), recycling technologies (especially chemical recycling), exchanging or preparation, for the valorisation of waste to be used as feedstock for other plants and companies across sectors and/or across value chains;
- Process (re-)design and adaptation to build a new circular value chain including energy, water and material flow, infrastructure and logistics;
- Investigate the availability and distribution of "waste" resources and logistic to ensure proper input of the specified material of the right quality and quantity to feed the new process in time;
- Integration of novel sensing technology, IoT and digital tools for the classification and sorting of solid waste streams to enable their efficient utilisation with as little downgrading as possible;
- New approach to end-of life materials removing the usual barriers of exploitation, enabling novel symbiotic interactions; unification of administration procedures, data sharing and preservation of data confidentiality;
- Define assessment methodologies and evaluate KPIs to measure the performance of symbiosis (SRL) and including environmental, economic and social impacts;
- Life cycle assessment and life cycle cost analysis should take into account existing sustainability standards (e.g. ISO 14000) and existing best practices;
- **Assessment of the economic, circularity and climate benefits**;
- **Study social aspects of the community and its improvement through I-US where demonstration is located, whilst also considering a gender and inclusiveness perspective;**
- Create societal awareness through a participative approach locally and more broadly, highlighting and communicating political and regulatory obstacle between regions/countries.
- Connect to the ECoP for knowledge sharing: know-how, challenges and recommendations on technological and non-technological aspects;

Proposals submitted under this topic should include a business case and exploitation strategy, as outlined in the introduction to this Destination. Interoperability for data sharing should be addressed. Clustering and cooperation with other selected projects under this call and others in Horizon Europe, with European initiatives (as for example: Circular Cities and Regions Initiative (CCRI) and European Circular Economy Stakeholder Panel (ECESP)), as well as building on existing projects,40 are strongly encouraged; see also Industrial Symbiosis Report of March 2020. This topic implements the co-programmed European partnership Processes4Planet. In
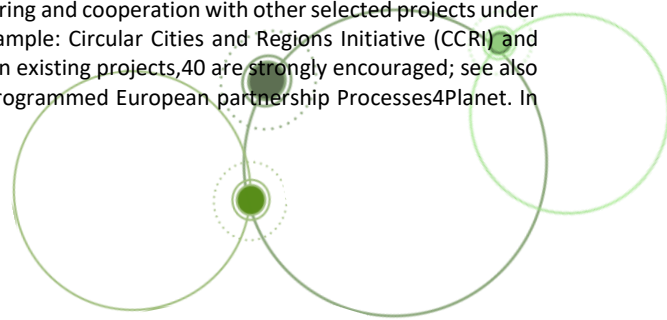
Call – Climate neutral, circular and digitized production

this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

| Type of action	Innovation action
Deadline	**30 March 2022**
Expected EU contribution per project	Between EUR 12.00 and 18.00 million
Topic information	Link

Topics with minor SSH relevance

HORIZON-CL4-2022-TWIN-TRANSITION-01-01: Rapid reconfigurable production process chains (Made in Europe Partnership)

Link

HORIZON-CL4-2022-TWIN-TRANSITION-01-07: Digital tools to support the engineering of a Circular Economy (Made in Europe Partnership)

Link

Call – Digitised, resource-efficient and resilient industry
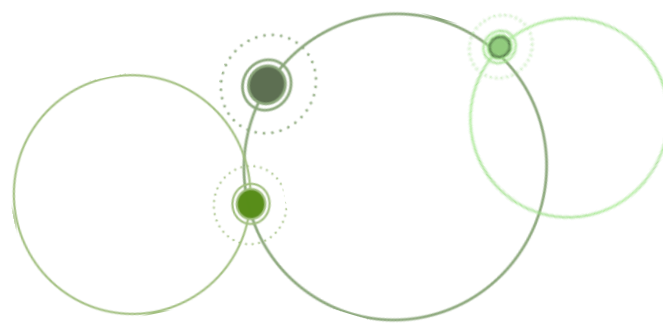
HORIZON-CL4-2022-RESILIENCE-01-03: Streamlining cross-sectoral policy framework throughout the extractive life-cycle in environmentally protected areas

Expected outcome

Projects outcomes will enable achieving the expected impacts of the destination by increasing access to primary raw materials, in particular critical raw materials for EU industrial value chains and strategic sectors. Projects are expected to contribute to the following outcomes:

- Exchange of good practices in permitting procedures related to extractive activities that may have an impact in environmentally protected areas;
- Dissemination and exploitation of projects outputs is tailored for competent EU, national and regional authorities, industry and civil society in EU Member States.

Scope

Reconciling the increasing demand for Critical Raw Materials necessary for the EU climate neutral ambition, with nature protection, restoration and biodiversity enhancement, requires strengthening the raw materials policy framework. Streamlining more efficient, effective and transparent permitting procedures throughout the mineral extraction life-cycle in environmentally protected areas, would contribute to securing the sustainable access to primary raw materials, whilst taking into account and reconciling requirements in environmentally protected areas. The actions should contribute to the exchange of good practices in permitting procedures related to extractive activities that may have an impact on environmentally protected areas. They should focus on reviewing good practices at the permitting stage in areas such as evaluating natural background conditions previous to the mineral extraction, evaluating the impact on human health and biodiversity, as well as foreseen nature protection and restoration measures. Particular attention will have to be paid to the legal obligations and practices ensuring compliance with EU nature legislation (Birds and Habitats Directives) and the goals of the EU Biodiversity Strategy for 2030.

The actions should analyse cross-sectorial policy coordination and integration covering economic, environmental and social aspects in the value chain of the extractive life cycle from finding and access to deposits to closure and rehabilitation, while focusing on the contribution of streamlined permitting procedures to deliver on the climate ambition of the European Green Deal. The actions should develop and disseminate analyses (including on the most affected raw materials, categories of sites, pressures, impact assessment methods, mitigation and compensation measures etc.) and training material; organise capacity-building workshops and seminars for competent authorities, industry and civil society in different Member States and other countries in Europe. These activities can also address other countries that are eligible to participate. All the data and information generated through these actions should be shared in open formats on a free of charge basis with the European Commission, for its own use and for publication. **Proposals should take into account issues of accessibility and inclusivity, such as age, gender, disability, and socio-economic background.**

| Type of action	Coordination and Support action
Deadline	**30 March 2022**
Expected EU contribution per project	EUR 2.40 million
Topic information	**Link**

Topics with minor SSH relevance

HORIZON-CL4-2022-RESILIENCE-01-16: Building and renovating by exploiting advanced materials for energy and resources efficient management

Link

HORIZON-CL4-2022-RESILIENCE-01-20: Climate Neutral and Circular Innovative Materials Technologies Open Innovation Test Beds

Link

Call – **Digital and emerging technologies**
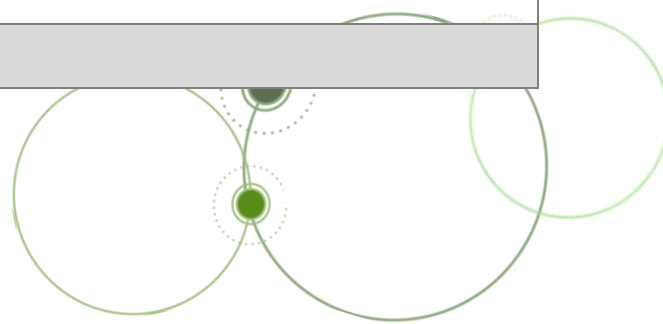
HORIZON-CL4-2022-DIGITAL-EMERGING-01-07: Increased robotics capabilities demonstrated in key sectors (AI, Data and Robotics Partnership)

<u>Expected outcome</u>

Proposals results are expected to contribute to at least one of the following expected outcome:

- Demonstrators able to show the added value of robotics and their performances in addressing challenges in major application sectors, or in dangerous, dull, dirty tasks or those strenuous for humans or in extreme environments.
- Systems able to demonstrate beyond human performance in complex tasks, with high impact in key sectors, that show extended levels of adaptation and flexibility.
- Systems able to show high levels of reactivity and responsiveness and intelligibility when performing human-robot and robot-robot interactions in major application sectors.

<u>Scope</u>

Proposals are expected to focus on application oriented use cases that enhance specific sectors in achieving significant improvements functional and economic performance. Proposals will integrate novel robotics technologies into solutions that are capable of autonomously taking over dangerous, dull and dirty jobs, or that are capable of achieving tasks beyond human capabilities, in a range of innovative applications in key sectors or that are capable of reaching the level of reactivity, flexibility and adaptivity and natural intelligibility required for smooth and beneficial human-robot, as well as robot-robot collaboration and interaction. **Engagement with SSH expertise is needed to improve human robot interaction design, behavioural intelligibility of robot interaction and action, especially in novel service applications, and to provide expertise on trustworthiness and acceptability by humans that impact at the design stage**. This topic will support innovation proposals, expected to exploit the latest robotics advances and demonstrate at TRL6-7 use-case scenarios considering end-user needs and expectations, in highly realistic operating environments, how they can directly contribute to the chosen application, supported by quantitative and qualitative industry or service related KPIs. Proposals need to make the case for the added value of such technologies, and demonstrating scalability, and short-term deployment potential. Progress should be demonstrated by appropriate KPIs, demonstrators, benchmarking and progress monitoring. The proposals should be primarily application driven, with a concrete problem-solving approach, exploiting the most suitable robotics technologies at hand. The focus should be on real-world scenarios which can benefit in short term from the technology and demonstrate substantial impact on the chosen application, also taking into account the maturity of the technologies which can solve the problems at hand. In case of shared workspaces, safe, dependable efficient and intuitive interaction will be key.

Considering that human factors and socio-economic aspects can limit or lessen efficient use of robots, human-centred and socio-economic approaches in combination with multi-stakeholder co-design activities can contribute to sustainable development of new enabling technologies. Putting people at the forefront will ensure novel transformation pathways, which help utilise existing technology in novel ways, and propose feedback loop systems that engage human users in developing new sociotechnical learning situations and tools. Further, agile sociotechnical learning designs, can remedy e.g., less efficient technologies, by emphasizing human aspects of technologies in any application sector, from service to production, to domestic use. **For this, an interdisciplinary approach involving both technical and SSH, in particular ethics, researchers is needed to improve interaction design and to provide expertise on trustworthiness and acceptability by workers, and address gender equality and intersectionality where relevant**. The involvement of the user industry and the workers, possibly also the social partners, would be key to drive the proposals, not only to identify the needs and the application scenarios, but to be involved in the testing of the solutions and providing feedback to adapt the solutions to optimise the working conditions and performances. This is also essential for the acceptance of the technology. A human-centred approach will be key in all proposals, with deep involvement of the workers, professionals and other relevant stakeholders including experts in human-centred design, work safety, ergonomics, social partners or work organisation as appropriate. They will closely collaborate with the technology providers and integrators. The proposals should also take into consideration trustworthy AI principles including respect of human dignity and agency. Special attention will be given to including users of diverse age, gender and background. Proposals are requested to dedicate at least 20% of their requested amount for FSTP to support SMEs or Start-ups in the development or enhancement of demonstrators, with a maximum of EUR 200 000 per third party, and 70% of the costs (100% for start-ups). The consortium will provide technical support with expertise in engineering integration, testing and validation to support the selected SMEs and start-ups acting as technology providers to demonstrate the added value of their solutions to address the challenges of the use-cases. The selection of the application sectors should prioritise high impact sectors and use-cases where the technology can demonstrate maximum added value. Each proposal will focus on one of the following use-cases:

- Demonstrating substantial added value of robotics in major application sectors with high socio-economic and/or environmental potential impact, improving the effectiveness and efficiency of processes or services.
- Demonstrating how robotics can improve human working conditions and satisfaction in taking over dangerous, dull, dirty or strenuous tasks, keeping workers away from unsafe and unhealthy jobs.

Proposals are encouraged, where appropriate, to develop configuration and deployment tools as well as tools for rapid configuration and re-configuration of robotics to improve deployability, reduce time to deployment, increase user driven (re)configuration, including through model-based approaches. When possible, proposals should build on and reuse public results from relevant previous funded actions. Proposals should make use of connections to the Digital Innovation Hub networks, particularly those in Robotics, Data and AI. Full use should be made of the common resources available in the AI-on-Demand platform, Digital Industrial Platform for Robotics, data platforms and, if necessary other relevant digital resource platforms. Communicable results from projects should
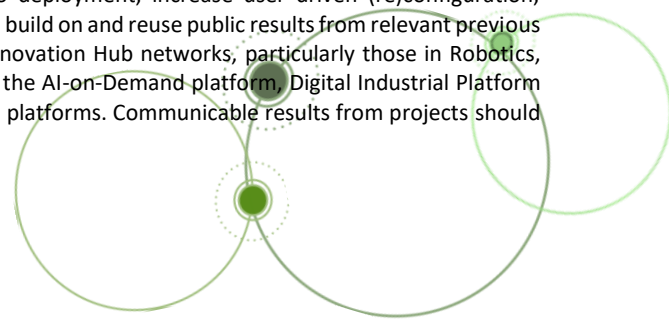
be delivered to the most relevant of these platforms so as to enhance the European AI, Data and Robotics ecosystem through the sharing of results and best practice. Proposals are expected to develop synergies with relevant activities in AI, Data and Robotics, primarily in destinations 1, 3, 4 and 6, but also in other destinations and clusters, and share or exploit results with relevant funded actions where appropriate. This topic implements the co-programmed European Partnership on AI, Data and Robotics. All proposals are expected to allocate tasks to cohesion activities with the PPP on AI, Data and Robotics and funded actions related to this partnership, including the CSA HORIZON-CL4-2021-HUMAN-01-02. Where relevant, synergies with other PPPs are encouraged.

Type of action	Innovation action
Deadline	**05 April 2022**
Expected EU contribution per project	EUR 6.00 million
Topic information	**Link**
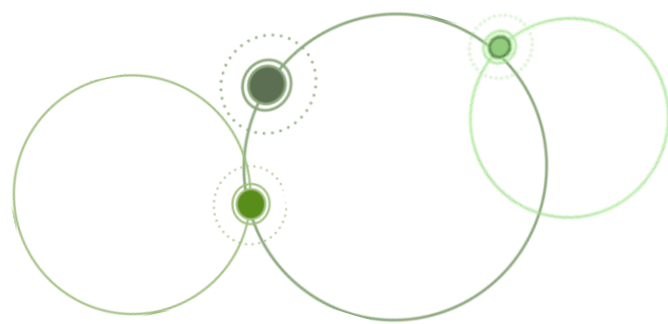
Cluster 5

Climate, Energy and Mobility

Call – **Climate sciences and responses**

HORIZON-CL5-2022-D1-01-01-two-stage: Carbon Dioxide Removal (CDR) approaches

Expected Outcome

Project results are expected to contribute to some of the following expected outcomes:

- Support climate policies through an enhanced understanding of existing and emerging carbon dioxide removal options in terms of their technical readiness, key requirements (land and other resource needs, geographical and geological constraints, primary energy needs, etc.), short- and long-term sequestration potential, permanence, impacts (**environmental, social, health**, resource depletion, etc.) including potential co-benefits.

- Support climate models and integrated assessment models through an improved parametrisation of these technologies and solutions, allowing their better integration into pathways and strategies and broadening the carbon dioxide removal technology options that can be numerically modelled.

- A harmonised, comprehensive and transparent methodology for the characterisation and comparison of such technologies and the barriers to their deployment, which can facilitate public discourse on their role and impacts.

- Gain better insight into the extended, system-level impacts of these technologies by considering ripple effects (e.g. extended impacts, land benefits foregone, opportunity costs, and rebound effects).

- Develop abatement cost estimates in function of time profile as well as factors like scale of deployment, key input factors (e.g., land/sea space, energy, reservoirs).

- Exploration and demonstration of business/ policy/ MRV (Monitoring, reporting and verification) frameworks for CDR uptake at scale, ranging from plant level to incorporation of CDR in international MRV and accounting (for example in the case of bioenergy trade).
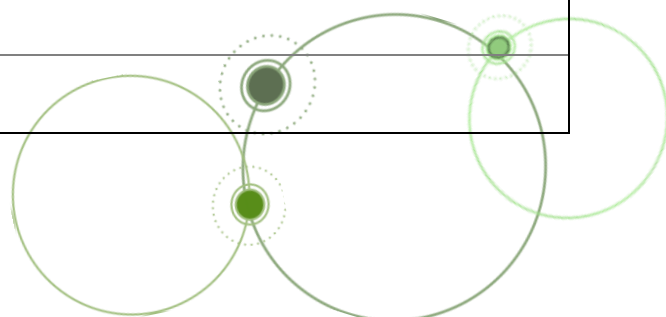
Scope

Projects under this topic should identify an extended range of nature-based and technical CDR methods, analyse and characterise them in a consistent and transparent assessment framework. In this way, projects should:

- Deliver realistic estimates of each approach's potential scale, cost, and effectiveness: on the basis of factors such as technical readiness, key land and other resource needs, geographical and geological constraints, primary energy needs (and associated impacts, including emissions), short- and long-term sequestration potential (including risk of non-permanence), key impacts (environmental, social, health, resource depletion, etc.) and risks.

- Allow the better parametrisation of integrated assessment models with respect to removals as well a better design of forward-looking policies. Develop abatement cost estimates in function of time profile as well variables like scale of deployment and key input factors.

- **Explore efficient incentive and governance frameworks to facilitate CDR uptake at scale, including social acceptance, ethical and regulatory considerations, as well as identifying major issues and options for establishing MRV and accounting systems associated with CDR in general and specific technologies where applicable**.

Analysis under this action should be based on practical experiences (in particular with a range of land-based projects), existing pilot and experimental projects, technical and theoretical analysis and review, including system-level impacts by considering ripple effects through consequential analysis, including land benefits foregone, opportunity costs and rebound effects, key barriers to deployment and governance challenges. Interactions with CCUS topics under Destination 3 and HORIZON-CL5-2021-D2-01-08: Emerging technologies for a climate neutral Europe under Breakthrough Technologies are encouraged. Projects investigating the use of CDR technologies for enhanced oil recovery are not eligible. Where appropriate, interaction with the topics related to climate-ecosystem interaction (HORIZON-CL5-2021-D1-01-08, HORIZON-CL5-2021-D1-01-09, HORIZON-CL5-2022- D1-02-05) as well as marine topics (Cluster 6) is encouraged in order to foster integrative and system approaches including different scientific communities and disciplines, as well as different sectors of the society.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Type of action	Research and Innovation Action
Deadline	1st stage - **10 Feb 2022** 2nd stage - **27 Sep 2022**
Expected EU contribution per project	EUR 7.00 million
Topic information	Link

Call – **Climate sciences and responses**

HORIZON-CL5-2022-D1-01-02-two-stage: Socio-economic risks of climate change in Europe

<u>Expected Outcome</u>

Project results are expected to contribute to some of the following expected outcomes:

- **A comprehensive socio-economic evaluation of future climate change impacts across sectors, countries/regions, timescales and climate building on socio-economic scenarios with improved sectoral, cross-sectoral and spatial resolution of impact projections.**

- **Improved climate change related decision support based on better understanding (and quantification) of the socio-economic risks (and opportunities)**, associated with climate change impact, for both sudden onset extreme events and slow onset processes.

- **Better evidence for ambitious climate policy response, both in terms of mitigation and adaptation measures, based on a better understanding of socio-economic risks in the absence of adequate mitigation and adaptation efforts (or when limits to adaptation are reached), leading to a more secure and more certain socio-economic future**.

- Actionable insights based on data at the appropriate level of geographical scale and spatial resolution for decision-makers in public and private sectors, including national and regional level estimations, leading to enhanced adaptation efforts and to a more resilient Europe.

- Better integration of climate change risks in public and private sectors' investment decisions - from property, through infrastructure up to regional and national supply chains - leading to increased long-term resilience.

- Enhanced coordination with European Commission's Joint Research Centre on research concerning climate impacts and adaptation modelling.

- **Provision of authoritative knowledge to inform the activities of the Horizon Europe Mission on Adaptation to climate change including societal transformation.**

<u>Scope</u>

Actions should improve the understanding of the nature and extent of physical risks from a changing climate and their integrated socio-economic implications in Europe in 2030, 2050 and 2100 timeframes. The analysis should evaluate the costs of inaction / "business as usual" by extrapolating current policies with different social and climatological scenarios. **It should seek to capture the range of possible socio-economic climate-related risks including both those most likely to occur as well as those associated with low-probability high-impact climate events with potentially catastrophic outcomes.** Indirect impacts should be part of the analysis as well as the impacts in the rest of the world with relevant spill over effects in Europe should also be considered. A comparison with scenarios with lower degrees of warming (with ambitious mitigation measures) should be included as well as the analysis of the costs and benefits of ambitious adaptation measures. Research should also improve the understanding of climate-related risks that are unlikely to be avoided through mitigation and/or adaptation and require urgent/specific response. The work could encompass improvements in adaptation modelling, in particular in impact areas with the highest potential damages. Actions should also take into account the impact of radical transformations envisaged in the context of the post-COVID recovery.

The impacts of climate risks should be assessed and monetised across various economic sectors aiming at an expansion of the existing impact categories and combining them into a coherent framework. Cross-sectorial impacts taking into account the interactions between various sectors should also be addressed. This research should equally encompass impact categories that cannot be directly monetised, but with either economy-wide implications or of critical importance for future human well-being, such as health (including the spread of infectious diseases), social justice, and biodiversity/ecosystems.

The development of appropriate tools and methodologies that are able to address these kinds of non-market based impacts is part of the scope. In addition, actions should aim at accounting for the various sources of uncertainty in a systematic way. A national, and as much as possible regional, resolution should be aimed at in order to account for heterogeneity in terms of hazards, exposure, vulnerability (including adaptive capacities) and ability to manage risks across countries and regions. Distributional and further equity considerations, including gender, associated with climate change impacts should also be investigated in order to inform the formulation of just mitigation and adaptation strategies. Development and testing of rapid analysis and assessment techniques using open data, tools and methodologies as well as work on an economy-wide damage function relating GDP losses or other metrics of public welfare and human wellbeing with temperature increase, could be part of the research, too. Actions should identify and formulate recommendations for measures that should be implemented by various stakeholders groups to minimise the climate risks across Europe as well as the needs for future research. They should explore effective ways for bridging the gap between science, policy and practice. The needs of the private sector in order to prepare for and adapt to climate change impacts should be an integral part of the work and could include development of approaches for better integration of climate risks into financing principles of the investment community.

This topic calls for a truly interdisciplinary approach combining a wide range of disciplines including economics, climate science, bio-geophysical modelling, data engineering, risk analysis, political and behavioural science etc. as well as for an active involvement of and co-creation with people and communities at risk. As much as possible, it should integrate the results of the
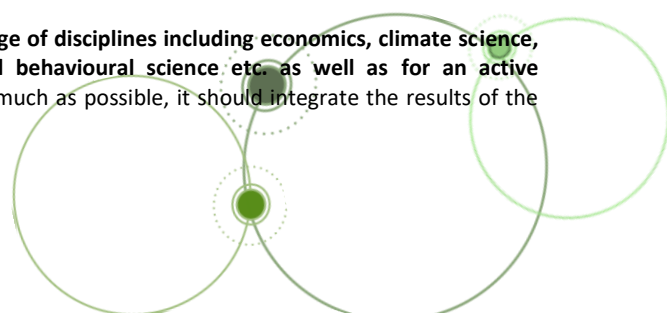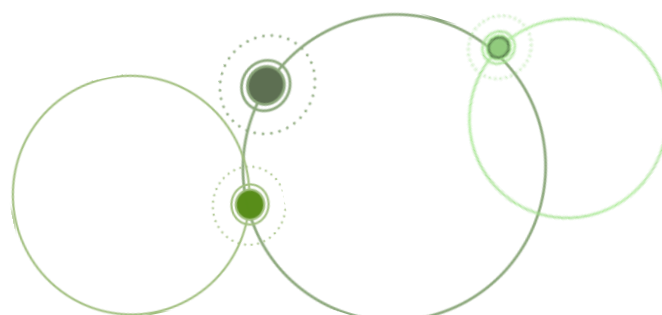
existing studies and evidence-base, including from previously funded projects such as COACCH and other projects from call SC5-06-2016-2017.

When dealing with models, actions should promote the highest standards of transparency and openness, as much as possible going well beyond documentation and extending to aspects such as assumptions, code and data that is managed in compliance with the FAIR principles. In particular, beneficiaries are strongly encouraged to publish results data in open access databases and/or as annexes to publications. In addition, full openness of any new modules, models or tools developed from scratch or substantially improved with the use of EU funding is expected. Synergies with topic HORIZON-CL5-2021-D1-01-05: Better understanding of the interactions between climate change impacts, mitigation and adaptation options, as well as with relevant topics in Cluster 3: Civil security for Society – Destination Area DRS02 on Support to improved disaster risk management and governance, should be explored and established. In addition, coordination with existing relevant initiatives on climate impacts and adaptation modelling should also be sought, including the PESETA assessment, in order to stimulate the use of common simulation protocols in European climate risk assessments, enlarge the coverage of climate impact areas, and improve the complementarity of modelling efforts.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Type of action	Research and Innovation Action
Deadline	1st stage - **10 Feb 2022** 2nd stage **- 27 Sep 2022**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

Call – **Climate sciences and responses**

HORIZON-CL5-2022-D1-01-03-two-stage: Social science for land-use strategies in the context of climate change and biodiversity challenges

<u>Expected Outcome</u>

Project results are expected to contribute to all of the following expected outcomes:

- A characterisation of future expected land use patterns consistent with long-term objectives (especially on climate, biodiversity and renewable energy) and its comparison with the current situation and trends.

- **A comprehensive understanding of the key motivations and drivers (economic, regulatory, legal, cultural, environmental, etc.) behind land-use related decisions in Europe at levels ranging from land owners to public authorities at local, regional and national level, including their relative importance.**

- A better understanding of the awareness of key actors (land owners, managers, local authorities, regulatory agencies) about climate change and biodiversity challenges and their willingness to contribute addressing them, including the adoption of new or different practices consistent with long-term expectations.

Support to climate (mitigation, adaptation) and biodiversity policy design and implementation through economic and behavioural insights allowing the efficient targeting of incentives and engagement of stakeholders in a cost-effective manner, taking into account telecoupling (displacement effects through changes in imports and exports).

<u>Scope</u>

Actions should aim to gain a realistic understanding of the factors behind land-use decisions and how they can be best oriented towards the efficient and socially responsible pursuit of multiple policy objectives on various scales (from the individual field/farm to region to national to continental scale). They should develop a toolbox of instruments and approaches deployable at different levels consistent with long-term goals and strategies considering, inter alia:

- The need for land to provide net sequestration and biomass flows consistent with the demands of various mitigation pathways, on different timescales.

- The continued need for land to provide food, feed and raw materials under increasing climate change and other pressures and needs (e.g., water availability, climate change resilience).

- The potential for demand-side measures that can contribute to long-term objectives (such as sustainable and healthy dietary change) and how they can be deployed.

- The crucial need for halting and, if possible, reversing biodiversity loss in Europe and globally.

- **The socioeconomic dynamics, behavioural patterns and inertia related to land ownership, management and policies.**

- The considerable diversity of land use patterns, approaches and biogeographic conditions in Europe, including land-related resources such as water.

- The need to make the instruments and approaches, including collective learning and negotiation processes at local and landscape scale, widely and practically available to the key actors, to enable sustainable change.

- The need to avoid rebound (detrimental displacement effects).

Actions should focus on one or more of the following issues:

a. Development of realistic scenarios and workable models for optimising the contribution of land to climate change mitigation, adaptation and biodiversity objectives, where possible integrating with Integrated Assessment Models (IAMs), consistent with expectations while reducing conflicts, exploiting synergies and managing risks (agroforestry can be one example of a system that allows higher productivity, more resilience and more biodiversity at the same time).

b. **Economic and behavioural insights into land use related decisions, barriers to change, efficient design of incentives. This should explore the relative merits of instruments (regulatory, market-based, education, soft policy).**

c. Explore a range of delivery mechanisms that could best incentivise the upscaling of the required changes under real-life situations in multiple settings (countries, biogeographical regions).

d. Develop workable models for effective and efficient monitoring and incentivising public goods benefits (such as emissions reductions, biodiversity protection and water services).

e. Contribute to the better quantification of land-related greenhouse gas flux trajectories for integrated assessment models on relevant scales (including displacement effects).

Participation of and co-creation with relevant societal stakeholders should be part of the action, including interdisciplinary and transdisciplinary research and the contribution from social sciences and humanities and other relevant disciplines. Synergies should be ensured with topics related to land-use, biodiversity and ecosystems in Cluster 5 and in other Clusters, with the implementation of the Mission on Adaptation to climate change including societal transformation, as well as with other relevant actions, programmes and initiatives.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH and gender expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.

Call – Climate sciences and responses

Type of action	Research and Innovation Action
Deadline	1st stage - **10 Feb 2022** 2nd stage - **27 Sep 2022**
Expected EU contribution per project	Between EUR 6.00 and 7.00 million
Topic information	[Link](#)

HORIZON-CL5-2022-D1-02-03: Improvement of Integrated Assessment Models in support of climate policies

Expected Outcome

Project results are expected to contribute to all of the following expected outcomes:

- Improved adequacy of Integrated Assessment Models (IAMs) to effectively contribute to international, European, national and regional climate policy processes in support of the implementation of the European Green Deal, the Paris Agreement, COVID-19 recovery and broader sustainability goals.

- Contributions to major international scientific assessments such as the reports of the Intergovernmental Panel on Climate Change (IPCC), the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the International Resource Panel (IRP).

- Increased robustness, legitimacy, relevance, usability and transparency of IAMs leading to increased uptake and better awareness of their results across various end-user groups, developing, where possible, new business models for IAMs transparency (for example, open source and open code options).

- Enhanced coherence between climate action (mitigation, understanding of impacts, climate risks and adaptation) and other environmental/sustainability objectives, notably biodiversity, based on a more realistic representation of their interactions, including co-benefits and trade-offs.

- **More active involvement of citizens in climate action based on better understanding and demonstration of how small scale actions contribute to the achievement of large-scale climate policy objectives including through socially innovative approaches, and better understanding of which actions/policies are more effective**.

- **Ultimately, accelerated transition towards climate neutrality based on improved knowledge and better designed policies that are more integrated, greener, healthier, more inclusive.**

Scope

Actions should improve the state-of-the-art of IAMs by tackling their existing weaknesses and lack of/limited capabilities of the current generation of models in order to provide robust, credible and transparent evidence-base in support of design and evaluation of multiscale (global, European, national, regional) mitigation policies at various time horizons. An important goal of this call is to address multiple challenges in a coherent and consistent manner using an integrated framework. To achieve this goal, it is not compulsory to incorporate all issues into a single IAM. Combinations of hard linking, soft linking and other ways of insuring a coherent approach between models and experts can be considered.

Actions should address developments and improvements, such as:

- Sectorial detail and (transformative/structural) changes across various sectors of the economy such as those resulting from increased circularity and digitalisation.

- Temporal resolution and technological detail.

- Spatial resolution with outputs suitable for national/regional level analysis.

- **Behavioural and lifestyle changes**.

- **Distributional and equity effects of climate policies.**

- Interactions with the relevant sustainable development goals (such as co-benefits due to avoided impacts and trade-offs in areas such as health, biodiversity, food security etc.).

- Climate change impacts, including the extent to which they can be avoided through mitigation action, synergies and trade-offs between climate mitigation and adaptation policies.

- **Financial sector and investment needs, including information in support of investment risk-reduction strategies to mobilise capital to finance the transition towards a climate-neutral economy.**

- **Uncertainties and risk-management strategies for supporting mitigation policies.**
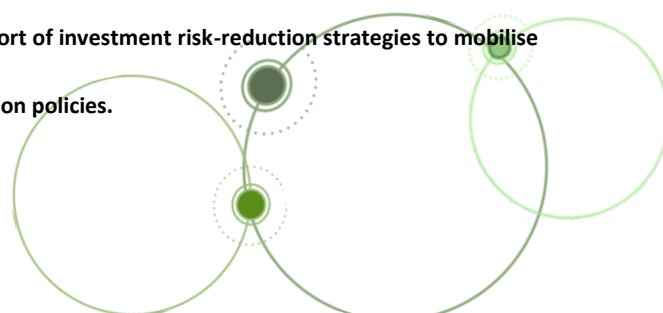
Call – **Climate sciences and responses**

The above list is non-exhaustive and actions also may propose new avenues of research, while duly justifying their choice and keeping in mind the impact on IAMs' relevance and adequacy as a decision-support tool. Actions should also explore options for making models more capable of responding to external shocks such as the COVID-19 pandemic or similar. While addressing the improvements, actions should take into account the modelling requirements and learnings resulting from the COVID-19 crisis. Actions should build on the knowledge base developed by previous initiatives and are encouraged to establish links with other relevant projects financed from this work programme (e.g. circular economy, climate adaptation modelling) and by Horizon 2020. In order to avoid duplication of efforts, proposals should clearly demonstrate how they will go beyond the modelling state of art. Actions are encouraged to explore alternative approaches to the mainstream economic assumptions typically underlying the models (such as fully functioning markets and perfect information) and aim at striking the right balance between model complexity and usability.

In order to maximise the impact, active involvement of the end-users (policy makers, business, civil society) in the co-design of models and validation of the outputs should be considered. Applicants should investigate and apply communication tools and strategies for improved interaction with stakeholders and dissemination of model results, duly accounting for the needs of non-technical audiences. They should further develop the thinking around the best ways to apply modelling insights to policies, including by building on the learnings from the COVID-19 pandemic. Consortia should also explore ways for better bridging the gap between modelling theory and practical applications, including in support of behavioural change and societal transformation. It is recommended to include capacity-building efforts to lower the entrance barriers to the established IAM community by involving research teams in EU Member States and Associated Countries that are less advanced in terms of modelling capabilities. When dealing with models, actions should promote the highest standards of transparency and openness, as much as possible going well

Type of action	Research and Innovation Action
Deadline	**10 February 2022**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

beyond documentation and extending to aspects such as assumptions, code and data that is managed in compliance with the FAIR principles46 . In particular, beneficiaries are strongly encouraged to publish results data in open access databases and/or as annexes to publications. In addition, full openness of any new modules, models or tools developed from scratch or substantially improved with the use of EU funding is expected.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Call – **Climate sciences and responses**
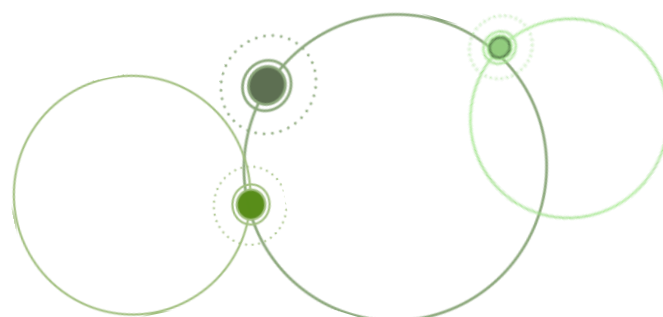
HORIZON-CL5-2022-D1-02-04: Supporting the formulation of adaptation strategies through improved climate predictions in Europe and beyond

<u>Expected Outcome</u>
Project results are expected to contribute to all of the following expected outcomes:

- Support to the implementation of the new EU Adaptation Strategy and the Mission on adaptation to climate change, including societal transformation, through better access to improved knowledge about climate impacts and fit-for-purpose data on individual and collective climate risks for all levels of government and stakeholders.

- Reduced vulnerability to climate change impacts based on decadal predictions which are a key source of information for better planning of adaptation options.

- Improved assessment of risks for people and systems exposed to extreme weather and climate events.

- Enhanced scientific collaboration and exploitation of synergies across the EU and Associated Countries for the provision of climate information to stakeholders engaged with the implementation of the EU Adaptation Strategy.

- Enhanced European cooperation and leadership in climate sciences e.g. in the frame of the Euro-CORDEX initiative, a part of WCRP's Coordinated Regional Climate Downscaling Experiment project (CORDEX).
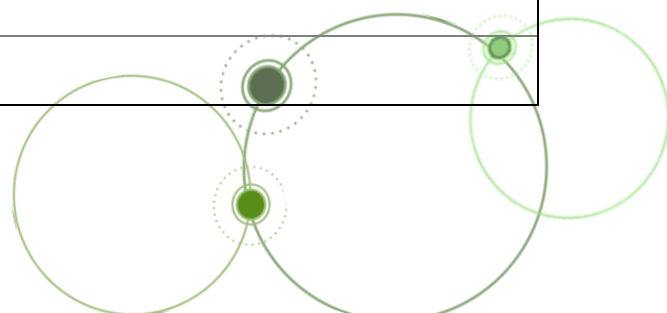
<u>Scope</u>
Proposals should aim at improving seasonal to decadal prediction to boost their quality at regional to local scale in particular for Europe and for variables of high societal relevance. Actions will enable progress in closing the gap between current skill and potential predictability estimates, as well as better aligning with immediate adaptation needs of end-users and making those predictions actionable. Ultimately, methodologies need to be developed to merge simulations from long-term weather forecast to climate predictions and projections, resulting in seamless climate information from sub-seasonal to seasonal and decadal predictions for the next 30 years. Proposals should also improve assessments of risk through extreme climate-related events on a range of temporal and spatial scales, as well as early detection of tipping points. Tackle uncertainties regarding regional patterns and magnitude of changes and improve understanding of how existing model biases affect the representation of extremes regarding the intensity and frequency of hazards, including the co-variability of different risk factors, and ultimately reducing the biases. **Better exploiting climate variables can enhance consistency with impact models and avoid potential mismatches, leading to better understanding of interactions between climate system and other natural and socio-economic systems (e.g. insurance practices) as well as feedbacks related to land use and cover, urban dynamics, air quality, etc., which are very relevant for model simulations at regional scale.**

Actions should explore novel ways of coupling existing impact models with climate models to provide quality forecast at the local scale, focussing for example on cities. Actions are encouraged to develop guidance on selection or aggregation of model data for local impact assessments, with clear justification of the procedures, allowing transformation of uncertainty into a manageable package of information. Coordination with the Destination Earth initiative can be proposed to ensure the timely development of "climate replicas" building on the new state-of-the-art IT infrastructure, including access to European high performance computing resources and an operational platform to upload and integrate the models and data developed in the course of the projects. Data should be FAIR47 and based on standards. Models should also be fully documented in terms of assumptions, architecture, code and data. Participants should also ensure synergies with relevant projects and initiatives (e.g. Digital Twin of the Ocean under the EU Green Deal call LC-GD-9-3-2020: Transparent & Accessible Seas and Oceans: Towards a Digital Twin of the Ocean and the Digital Europe Programme). Model development should be properly connected with major programmes in the domain of Earth Observation such as the Copernicus Programme and the ESA science satellite missions in Europe, as well as the Group on Earth Observations (GEO) and the Global Earth Observation System of Systems (GEOSS) at global level.

Actions should ensure the dissemination of project results to policy-makers and stakeholders to support long-term planning. International cooperation is encouraged with the aim to ensure the sharing of knowledge and experience between Europe and third countries on climate change impact and adaptation option modelling and assessment. **This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH and gender expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.**

Type of action	Research and Innovation Action
Deadline	**10 February 2022**
Expected EU contribution per project	EUR 10.00 million
Topic information	Link

Call – **Climate sciences and responses**

HORIZON-CL5-2022-D1-02-05: Let nature help do the job: Rewilding landscapes for carbon sequestration, climate adaptation and biodiversity support

Expected Outcome

Project results are expected to contribute to some of the following expected outcomes:

- Contribution to IPBES and IPCC, to the achievement of objectives of reaching net zero carbon emissions, enhancing climate change adaptation, and to the EU Biodiversity Strategy.

- Support the implementation of the Horizon Europe Mission on Adaptation to climate change including societal transformation.

- Identify low cost/benefit ratio options to restore natural and semi-natural ecosystems for carbon sequestration and biodiversity conservation.

- Assess the value of restoring ecosystem for adaptation to and/or mitigation of climate change and identify potential rebound effects and trade-offs.

- Demonstrate the degree to which these approaches are affected by climate change itself and if they can still be effective under global warming of 2°C and higher.

- Demonstrate the potential contribution of European abandoned land and protected areas systems for carbon sequestration, adaptation to and/or mitigation of climate change.

- Develop strategies to minimize the increasing risk of wildfires due to the changing climate.

- Provide operational methods for low cost, low human intervention options for ecosystems restoration optimising the contributions to climate and biodiversity objectives and managing trade-offs.

- Help generate FAIR data and well-documented, robust and transparent methodologies for better integration of land-use management systems into IAMs and ESMs.

- Assess the perception and acceptability of citizens and stakeholders on rewilding and rewilding options and identify potential conflicts and trade-offs in governance and decision-making.

Scope

The biodiversity crisis and the climate crisis are intrinsically linked and the contribution of Nature-based Solutions (NBS) to the global climate objectives is pivotal. A better understanding of how the use of ecosystems natural capacity, with minimal help from humans, can contribute to carbon sequestration and biodiversity conservation is urgently needed to make the use of NBS operational. Actions should foster interdisciplinary research with a focus on the climate-biodiversity nexus, advancing our knowledge to further promote integrated approaches to better address these interdependent challenges. Actions, taking stock of previous and ongoing experience, including associated uncertainty, should provide a robust assessment of the potential contribution that restoring ecosystems, including trophic chains restoration, with a "let nature do the job", also called "rewilding", approach can provide in terms of carbon sequestration and storage, climate change mitigation and adaptation and biodiversity conservation. "Rewilding" is meant here as passive management of ecological succession with the goal of restoring natural ecosystem processes and reducing human control of landscapes, although some intervention may be required in the early restoration stages.

Actions can address specific ecosystems and/or landscapes on land, freshwater, coastal and marine ecosystems while providing a clear contribution to define the potential use of the "rewilding" approach at regional, national and continental levels. Actions should build on an updated and detailed picture of the status and trends of ecosystems change, (including, where applicable, land abandonment) in Europe to assess where, at which ecological conditions and at what scale the "rewilding" approach can significantly improve carbon sequestration together with habitats reinforcement and biodiversity conservation. Actions should investigate how "rewilding" can be complemented with other approaches (for example active restoration and conservation, low intensity farming, forestry and pasture management, fishing), taking into account specific regional conditions, to increase carbon sequestration, improve biodiversity conservation and ensure provision of goods and ecosystem services. Actions should provide scientific insights, tools, methodologies and innovative solutions including social innovations to assist national governments, regions and communities in embedding the "rewilding" approach, as far as feasible, in their own plans to reach carbon neutrality.

Actions should also advance the integration of land use options for carbon sequestration into IAMs and ESMs. Actions should significantly advance knowledge on the role and relevance of restoring fully functional trophic chains, for instance through the conservation, management and reintroduction of apex predators, grazers and scavengers, in the "rewilding" process, with a special focus on the functioning of trophic cascades on landscape processes and the ability of ecosystems to act as carbon sinks. **Challenges and barriers to this aim should be analysed and the involvement of Social Sciences and Humanities is recommended. Actions should ensure appropriate multi-stakeholder collaboration and interdisciplinarity to embed socio-economic aspects, including opportunities for economic development, existing barriers (ecological, social, gender-related…) and potential synergies and drawbacks.**

Actions should envisage clustering activities with other relevant actions, initiatives and programmes, including Horizon 2020 and the LIFE Programme to promote synergies, integration and co-operation. They should make use and contribute to knowledge exchange and networking European platforms (e.g. Climate-ADAPT, Network Nature, OPPLA, BiodivERsA). Cooperation and planning for further
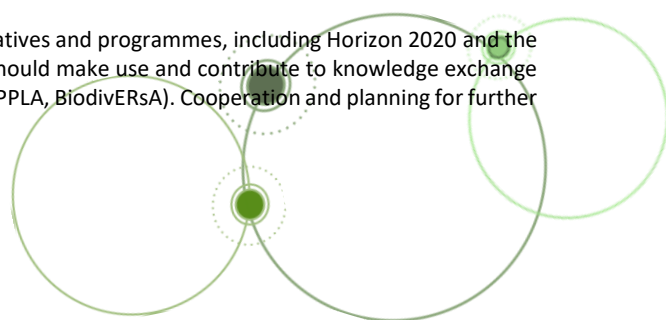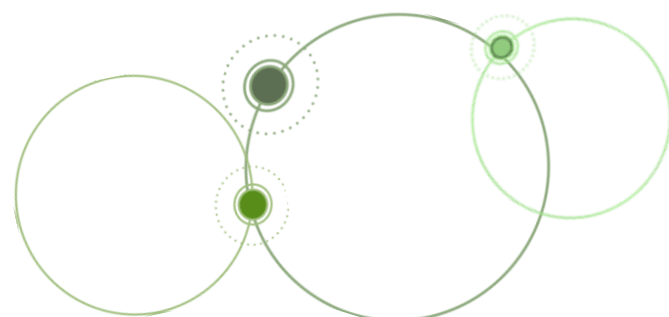
exploitation of actions results during and after the project end is strongly encouraged. Synergies should be ensured with projects addressing wildfires (for example under the EU Green Deal call LC-GD-1-1-2020, Horizon 2020 Societal Challenge 5).

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH and gender expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.

Type of action	Research and Innovation Action
Deadline	**10 February 2022**
Expected EU contribution per project	Between EUR 8.00 and 9.00 million
Topic information	Link

HORIZON-CL5-2022-D2-01-11: CIVITAS 2030 – Coordination and support for EU funded urban mobility innovation

Expected Outcome

Projects are expected to contribute to all of the following outcomes:

- Increasing the extent and speed of the take up of innovative, replicable urban mobility solutions in Europe, targeting responsible authorities and other stakeholders, in order to contribute to the priorities of the European Green Deal, which stresses that ''transport should become drastically less polluting, especially in cities. A combination of measures should address emissions, urban congestion, and improved public transport'':
  - Develop, and put in place a communication, dissemination and promotion strategy that will clearly distinguish the identity of the CIVITAS initiative amongst other European city initiatives.
  - Provide a common communication and dissemination framework for CIVITAS urban mobility projects and their living labs, but also other projects that express interest in receiving CIVITAS support (referred to from now on as 'the projects'), including providing a common corporate identity and producing a monthly newsletter that includes project results as well as wider developments in the field of sustainable urban mobility.
  - Provide a common realistic and user-friendly evaluation framework with dedicated support for its implementation.
  - Reach out to national transport press correspondents and relevant European media, the Horizon project community and a wider European and international audience of cities and professionals with the aim of increasing the visibility of the network and urban mobility projects.

- Monitor results and implementation activities in the projects and provide the European Commission with a bi-annual report.
  - Facilitating exchanges among the projects and the European Commission with the aim of disseminating project key milestones and results.
  - Organising capacity building, replication and twinning sessions and three site visits per year, based on latest results and best practices from the projects, to support the take up of innovative urban mobility solutions.
  - Organise a CIVITAS Forum once per year to share results and best practice from the projects. o Collaborate on the organisation of the Urban Mobility Days (flagship conference on innovative, clean and integrated urban mobility
  - Collaborate on the organisation of the Urban Mobility Days (flagship conference on innovative, clean and integrated urban mobility and transport).
  - Disseminate project results as well as wider developments in the field of sustainable urban mobility, European media outlets, of cities and professionals.
  - Assess the CIVITAS newsletter database and increase it by 20% every year.
  - Offer the projects' liaison activities, collaboration and synergy building with the different urban mobility communities and initiatives at European level, such as the ELTIS, EIP SCC, Driving Urban Transitions Partnership, EIT Urban Mobility and the Climate Neutral and Smart Cities Mission.
  - Maintaining, optimising and promoting the CIVITAS website through usability tests, and improving its functionality, to ensure that it remains the main platform for the dissemination of relevant European urban mobility innovation results increasing the minimum of unique visitors with 20% every year.
  - Increase the CIVITAS twitter followers by 20% every year. Provide a strategy for social media engagement.
  - **In collaboration with European Commission services, prepare two policy papers per year on innovative solutions, good practices, and their replication, putting in place three ad-hoc Thematic Groups (based on the thematic areas of CIVITAS) to analyse developments and prepare recommendations**.
  - Organise minimum two meetings per year of the CIVITAS Policy Advisory Committee, with one policy paper issued per year, to facilitate a continued dialogue between mayors, businesses and civil society.
  - Prepare policy recommendations and key learnings addressed to cities, Member States/Associated Countries and the European Commission based on latest technological and planning trends, research and innovation as well as results from ongoing projects.
  - Updating, promoting and enlarging the CIVITAS cities network, with at least 20 new European cities added per year.
  - Providing support and funding to existing CIVINETS, maintaining the secretariat for the CIVITAS initiative, and actively engaging with local, regional or national stakeholders, aiming to overcome language and other barriers**.**

Scope

Together with initiatives of ELTIS and the European Mobility Week, CIVITAS is part of the EU policy on urban mobility as a key flagship encouraging innovation at local level. Since 2002 it acts as an open platform that facilitates research, the uptake of innovative solutions, the validation of research results, the exchange of knowledge and best practices, and common learning in the area of urban mobility and transport. The project selected under this topic will help to ensure the long-term support for the CIVITAS projects offering governance, and an organisational and logistical framework that guarantees the wide dissemination and take up of urban mobility project results. **Proposals should aim at focusing activities on communication and event organisation and coordination of living lab activities continuing and enhancing the operation of the platform, to facilitate the continued coordination and knowledge exchange between the urban mobility projects that have been, or that will be funded under the CIVITAS initiative (not exclusive)**. These projects will deliver solutions that help achieve climate neutrality in cities, covering both personal mobility and goods/urban logistics using all transport modes. **Proposals should aim at putting in place a common communication and**

dissemination strategy to maximise the impact of the CIVITAS initiative. Proposals should ensure the monitoring of activities, events and results of the urban mobility projects and communicate about their progress and achievements. Applicants should also review the common 'CIVITAS Process and Impact Evaluation Framework' and ensure the continuity of the CIVINETs. They should ensure continuity and provide a smooth transition from the previous Coordination and Support Action, CIVITAS ELEVATE.

Type of action	Coordination and Support Action
Deadline	**06 September 2022**
Expected EU contribution per project	Between EUR 4.00 and 5.00 million
Topic information	[Link](#)

Call – Sustainable, secure and competitive energy supply
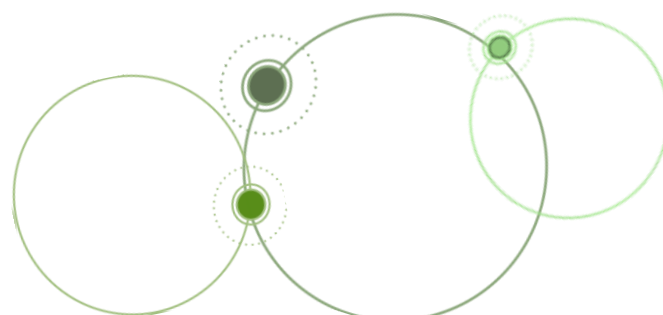
HORIZON-CL5-2021-D3-02-02: Sustainability and educational aspects for renewable energy and renewable fuel technologies

<u>Expected Outcome</u>

The EU has ambitious goals to tackle the ongoing climate crisis, noteworthy being the aim to be a fully climate-neutral continent by 2050. Thus a framework needs to be established where sustainability and educational aspects for renewable energy and fuel technologies is addressed. Further, these actions need to engage with stakeholders at different levels (policymakers, regulators, innovators, industry, trade associations, universities and local communities) in order to align priorities and needs, while also identifying possibly overlooked challenges. In this context, and taking into consideration circularity and sustainability, project results are expected to contribute to all of the following expected outcomes:

- **Enhance and promote sustainability by addressing social and environmental aspects** (air pollution, waste management, job opportunities, wildlife concerns, etc.) of renewable energy and renewable fuel technologies at a global level, thus ensuring the European Green Deal priorities are met.

- Support the development of training and reskilling efforts in the renewable energy and renewable fuel technology sectors, while also identifying (global and local) challenges, to realise the large deployment ambitions of the European Green Deal, and the various sectorial strategies under it (such as the recent Offshore Renewable Energy Strategy) and its external dimension.

- Support and promote circularity concepts and approaches (such as circular- and/or recyclable-by-design) in line with the Circular Economy Action Plan and the Action Plan on Critical Raw Materials.

<u>Scope</u>

In this topic, sustainability is meant in environmental, social and economic terms. The proposal is expected to address all the following aspects:

- Coordinate the stakeholder community and propose concrete actions to promote and accelerate the development of sustainable solutions for renewable energy and renewable fuel technologies, encompassing 'circularity-by-design' (with special attention to life cycle assessment of the entire value chain, including critical raw materials and gradual substitution of fossil fuels), and identifying and assessing relevant externalities.

- **Set up and initiate a structured programme to promote an innovative multi-disciplinary approach on teaching and engaging with the sustainability of all forms of renewable energy.** The proposal should also actively engage with European universities in this matter. Special consideration to gender balance issues should also be given. A clear post-project life for such programme should also be addressed.

- Develop and run an industry-academia programme focused on hands-on training. This programme should identify the required skills needed for the sustainability of renewable technologies, identify and act on knowledge gaps, and identify retraining opportunities based on revamped training curricula and course content. These concerted actions are expected to develop human capital in innovative new technologies through education and training.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Type of action	Coordination and support Action
Deadline	**05 January 2022**
Expected EU contribution per project	EUR 2.50 million
Topic information	**Link**

Call – **Sustainable, secure and competitive energy supply**
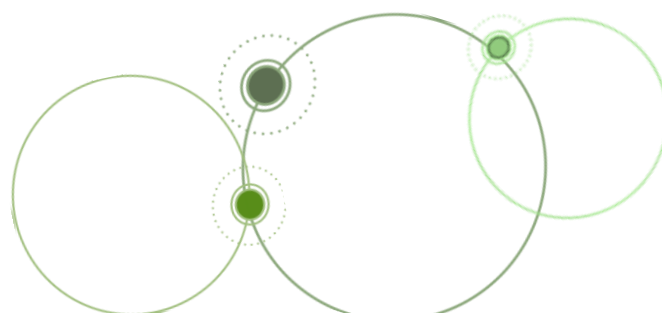
HORIZON-CL5-2021-D3-02-03: Market Uptake Measures of renewable energy systems

Expected Outcome

Project results are expected to contribute to some of the following expected outcomes:

- Facilitate the wider uptake of renewable energy systems in the energy, industrial and residential sectors leading to an increased share of renewable energy in the final energy consumption by 2030 and beyond.

- Contribute to provide a basis for policy-makers and stakeholders for developing more informed RES policy and for analysing about the market dynamics when including all renewable energies.

- Contribute to the development of markets and respective financial frameworks that can operate efficiently and incentive-compatible while accommodating massive shares of renewables.

- Increase societal acceptance of renewable energy facilities and installations through science-based evidence and tools addressing misperception phenomena from citizens**.**

Scope

The proposal is expected to develop solutions addressing at least 2 of the expected outcomes either for the entire renewable energy market or focusing on a specific energy sector, such as electricity, heating, cooling or renewable fuels. Proposals can also address issues within a specific geographical region such as urban and peri-urban areas. **Issues related to acceptance of RES technologies due to cultural heritage landscape particularities can be addressed.** Self-consumption issues can be addressed too. International aspects, such as collaboration with third countries and promoting solution in new markets, can be addressed as well. The proposed solution can be developed to address a local challenge but needs to have wide potential for reapplication. The solution should have a long term viability and not be limited to an ad-hoc fix. The methodologies applied may be inspired by successful approaches already tested in other fields or contexts.

For all actions, the consortia have to involve and/or engage relevant stakeholders (e.g. businesses, public authorities, civil society organisations) and market actors who are committed to adopting/implementing the results. The complexity of these challenges and of the related market uptake barriers may call for multi-disciplinary approaches, which should include contributions from the social sciences and humanities. Where relevant, regional specificities, socio-economic, gender-related, spatial and environmental aspects will be considered from a life-cycle perspective.

Where relevant, proposals are expected to also assess the legal, institutional and political frameworks at local, national and European level and examine how, why and under what conditions these could act as a barrier or an enabler.

Type of action	Coordination and support Action
Deadline	**05 January 2022**
Expected EU contribution per project	EUR 2.00 million
Topic information	**Link**
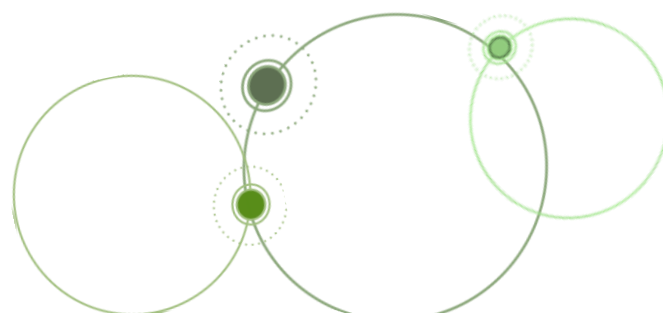
HORIZON-CL5-2021-D3-02-05: Energy Sector Integration: Integrating and combining energy systems to a cost-optimised and flexible energy system of systems

<u>Expected Outcome</u>

Project results are expected to contribute to most of the following expected outcomes:

- Demonstrated benefits of sector integration in different geographic, climate and economic conditions.
- Improved planning of integration of power, heat, gas, industry with a production site(s) of renewable energy.
- Optimised operations of coupled networks (e.g. electricity vs. heating).
- Validated tools and platforms enabling effective sector coupling as tested in large demonstration projects.
- Consolidated methodology to evaluate the impacts on OPEX, CAPEX and overall value creation connected to the integration of flexibility from storage and other energy flexibility solutions.

<u>Scope</u>

Projects should demonstrate the benefits of the integration of different elements. This includes in particular electricity and gas networks, district heating and cooling, and long term energy storage systems (for example Hydrogen, power-to-X, thermal storage, hydro-storage). It can also include mobility systems (e.g. e-mobility infrastructure) and energy-intensive industry and/or industrial clusters or sites. Projects should demonstrate the integration at local (i.e. distribution networks) and at national level (i.e. transmission networks), and the interactions between them.

- Develop 2 or 3 pilots in different Member States/Associated Countries that demonstrate of solutions for energy system integration based on integrated management of various networks and infrastructures. The pilots could include for example:
  - Electricity and gas networks;
  - Implementation of solutions for district heating and cooling as sector integration for energy storage and flexible operation at different energy carriers;
  - E-mobility infrastructure;
  - Solutions for industry and industrial clusters for integrated flexible generation, consumption and energy storage;
  - Flexible stand-alone systems and tools for living quarters and small and medium sized businesses and industries based on renewable generation, sector-coupling and storage technologies;
  - Integrated systems to allow for long term (weekly, seasonal) energy storage.
- Demonstrations can be build up based on a combination and integration of various locally optimised grids into overall system management.

Projects should provide a preliminary analysis including country-specific challenges, a sustainability assessment for the environmental impact, social acceptance, as well as economic feasibility. **The participation of inter- and trans-disciplinary consortia combining expertise and capacity from public authorities, urban stakeholders, infrastructure providers, knowledge institutions, planners, entrepreneurs, societal actors and citizens is advised to address the challenges of this topic**.

Projects should develop a consolidated methodology to evaluate interaction of coupled networks and the impact on OPEX and CAPEX connected to the integration of flexibility from storage and other energy vectors as well as to build upon integrating knowledge on cost reduction for the relevant conversion processes.

Projects should develop innovative tools for:

- **Assessment of technical and operational challenges, including environmental impact and social acceptance.**
- System planning toolboxes to determine the optimal sizing, location and distribution of energy storage systems and technologies to facilitate their optimal use at different grid levels, as well as system planning toolboxes to determine the optimal location and utilisation rate of available energy conversion plants.
- Aging models' definitions for several storage technologies according to the operating conditions and required regulation services.
- Communication, platforms and devices for increased observability/controllability of the generation, consumption and storage resources and the measurement acquisition.
- Tools to quantify the flexibility provided by sector integration.

Where relevant, projects should collaborate with the Clean Hydrogen Joint Undertaking on aspects that require integration of hydrogen. Activities in relation to production of hydrogen are excluded, as all production aspects are covered through calls of the Clean Hydrogen Institutional Partnership. Fuel Cell Micro Boilers technology is also excluded due to technology development through the Clean Hydrogen Partnership. Cooperation with the Clean Hydrogen Partnership, for example through joint projects, is however welcomed. The selected projects are expected to contribute to relevant BRIDGE activities.
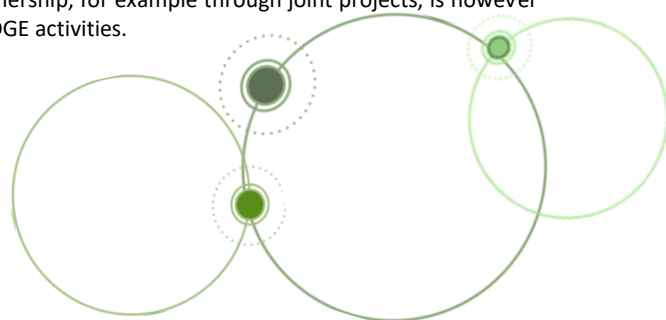
Type of action	Innovation Action
Deadline	**05 January 2022**
Expected EU contribution per project	Between EUR 9.00 and 10.00 million
Topic information	**Link**

HORIZON-CL5-2021-D3-02-13: Cost reduction of CO2 capture (new or improved technologies)
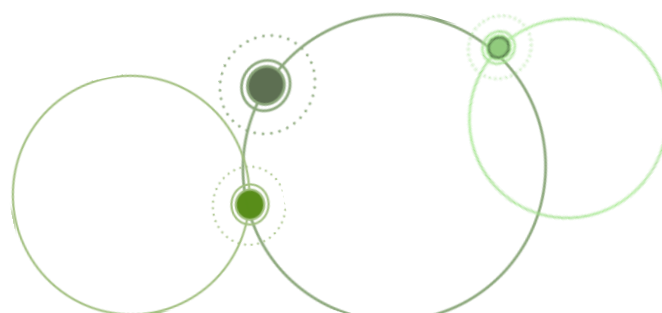
Expected Outcome
Significant step-change advances in CO2 capture rates, reductions in energy penalty and cost of CO2 capture as well as facilitating safe and economic integration into industrial clusters - which will in a short timeframe allow the uptake of CCUS in the power sector and energy intensive industries.

Scope
The high cost of carbon capture is still the most relevant stumbling block for a wider application of CCUS. Commercial deployment of CCUS requires a significant reduction of the energy intensity of the CO2 capture process for power plants or other energy-intensive industries, and a substantial decrease of the cost of capture. A continuous effort is needed to develop and demonstrate new or improved capture technologies. The objective is the pilot demonstration of advanced CO2 capture technologies that have a high potential for increasing capture rates and efficiency, while reducing energy penalty and improving cost-efficiency of the whole capture process. Projects will test operating conditions and operational flexibility, and provide proof of the reliability and cost-effectiveness of these concepts, whilst at the same time evaluating the cost, technical requirements and operational and safety impacts on the industrial facility and the associated transport and storage infrastructure. The proposal should state credible and clearly defined targets and key performance indicators (KPIs) for the energy penalty reduction, the capture rate and the relative capital and operating costs of the capture process. Environmentally benign technologies have to be pursued and their environmental impact addressed in the project also in view of future scaling up.

Technology development should be balanced by an assessment of the societal readiness towards the proposed innovations, including by identifying and involving relevant end users and societal stakeholders (such as civil society organisations, non-governmental organisations, and local associations) in deliberative processes and analysing their concerns and needs using appropriate techniques and methods from the social sciences and humanities. Proposals are expected to include aspects of circularity and best use of resources.

Type of action	Research and Innovation Action
Deadline	**05 January 2022**
Expected EU contribution per project	Between EUR 10.00 and 15.00 million
Topic information	**Link**

HORIZON-CL5-2021-D3-03-02: Next generation of renewable energy technologies

Expected Outcome

Project results are expected to contribute to all of the following expected outcomes:

- Available breakthrough and game changing renewable energy technologies enabling a faster transition to a net-zero greenhouse gas emissions EU economy by 2050.
- **Knowledge and scientific proofs of the technological feasibility of the concept including the environmental, social and economic benefits to contribute to R&I strategy and policy forecast.**
- Establishing a solid long term dependable European innovation base.

Scope

The proposal is expected to address high-risk/high return technology developments for game changing renewable energy technologies including catalyst development, dedicated storage systems and integration of renewable energy technologies into a single energy generation system, heating & cooling systems, fuels production systems, hybrid electricity generation solutions between different renewable energy sources, direct utilization of renewable energy sources.

The following areas should not be covered as they fall within the scope of partnerships or other calls:

- Pure material research;
- Conventional hydrogen production and fuel cells;
- Batteries. However the production of renewable hydrogen directly from renewable energy sources is within the scope of the topic.

The proposal should validate its concept to TRL 3 or TRL 4 through a robust research methodology and activities, establish the technological feasibility of its concept, consider transfer developments in sectors other than energy whenever relevant, as they may provide ideas, experiences, technology contributions, knowledge, new approaches, innovative materials and skills.

In developing its concept the proposal is expected to address the following related aspects: lower environmental impact, better resource efficiency (materials, geographical footprints, water, etc...) than current commercial renewable technologies, **issues related to social acceptance or resistance to new energy technologies, related socioeconomic and livelihood issues. Considerations should be given to the regulatory frameworks for their adequate integration.**

The project should also document the research process thoroughly - methods, data, results - to ensure that future research and deployment builds on lessons from positive and negative attempts made, through for example public deliverable, ORDP, etc. in order to ensure that the final results and data are actually available after the project end.

Type of action	Research and Innovation Action
Deadline	**23 February 2022**
Expected EU contribution per project	EUR 3.00 million
Topic information	**Link**

Call – **Sustainable, secure and competitive energy supply**
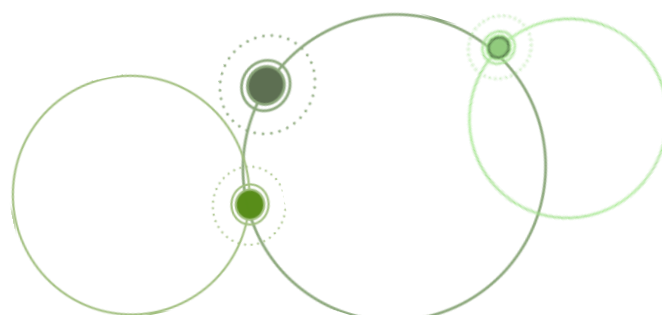
HORIZON-CL5-2021-D3-03-05: Wind energy in the natural and social environment

Expected Outcome

Renewable energy technologies will be evermore present in the lives of European citizens, thus a harmonious co-existence is essential. Wind turbines are particularly susceptible to the NIMBY effect (Not In My BackYard), and hence it is facing opposition despite being a high-potential clean energy source. In order to achieve the European goals on climate neutrality, dedicated actions in this context are needed to ensure that large turbines retain a low environmental impact and gain more popular support. A particular focal point should be how to best engage with different communities to identify actions toward the co-existence goal.

Project results are expected to contribute to all of the following expected outcomes:

- Develop and promote the use of modelling tools and objective holistic assessment metrics for realistic in-depth analysis of cumulative impacts of wind installations on the environment and on local communities;

- Develop guidelines to enhance energy citizenship of (onshore or offshore) wind energy and farms, promoting a harmonious co-existence between the local population, other sectors (e.g. fishing communities, tourism) and the wind farms;

- Realise outreach activities to promote social awareness and engagement on wind energy, and develop guidelines for participatory processes in wind farm development to reach interactive and mutually value-enhancing outcomes;

- Facilitate both the identification of future areas for deployment, notably of offshore wind farms, and the consenting process.

Scope

The proposal is expected to address all the following aspects:

- **Develop and promote the use of validated models and guidelines as a tool for enhanced societal engagement. Further, it should also demonstrate how participatory processes can enhance value creation and achieve higher social acceptability of wind energy;**

- Assess through validated models how wind turbines impact the local environment (noise, impact on soil or sea beds, visual effect, effects on animal life and other species). In addition, it should also assess, if applicable, how offshore wind turbines (and fixed or floating substructures) impact the local marine environment (currents, waves, upwelling, and sediment transport). Finally, it should help to identify the best areas for deployment and to develop new designs and/or enhanced control strategies of wind turbines to address potential impacts;

- Develop a forum where regulators, industry, and local communities can exchange information and provide input to one another. Further, it should also identify the effect that the implemented models have on promoting wind energy;

- Address how the impact of different wind energy innovations and applications (onshore, offshore, floating, and airborne) is seen by the general public and the local actors.

This topic requires the effective contribution of Social Science and Humanities (SSH) disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. Social innovations should also be considered, notably as new tools, ideas and methods leading to active citizen engagement and as drivers of social change, social ownership, and new social practices.

Type of action	Research and Innovation Action
Deadline	**23 February 2022**
Expected EU contribution per project	EUR 3.00 million
Topic information	Link
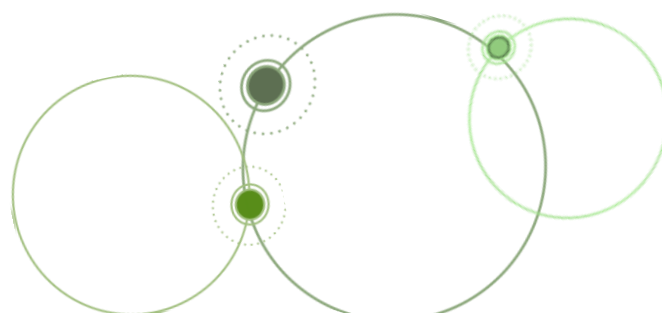
HORIZON-CL5-2021-D3-03-10: Innovative foundations, floating substructures and connection systems for floating PV and ocean energy devices

Expected Outcome

Project results are expected to contribute to all of the following expected outcomes:

- Improved overall life time, reliability, installability, operability and maintainability of marine substructures, mechanical joints and energy connection systems for ocean energy devices and/or offshore floating PV to reduce degradation and failure rates and thus investment risk.

- Better understanding of the device's real life performance allowing a safe reduction in the over-engineering of devices' specifications.

- Reduction of LCOE in line with the SET Plan targets (actions should clearly justify estimated LCOE at project start and end, using a recognised calculation methodology).

- Contribution to the objectives of the Mission Healthy oceans, seas, coastal and inland waters.

Scope

The action is expected to:

- Test and validate the potential benefits of new circular materials in offshore floating PV and/or ocean energy substructures, foundations and if relevant mooring and anchoring systems whilst ensuring structural integrity and durability considering very high wind (speed >25 m/s), current (>1.2 m/s) and wave (height >14 m) loads and corrosion and biofouling on all elements of the ocean energy systems.

- Test and validate new prototype components and materials used in offshore floating PV and/or ocean energy devices and verify that they are compatible with and resistant to the marine environment.

- Research material properties and behaviour in combination with the use of improved predictive computational modelling tools.

- Research, develop and validate improved predictive computational modelling tools for material properties.

The use of existing test facilities and related research infrastructures for the purposes of the project should be considered.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

The selected projects are expected to contribute and participate to the activities of the project BRIDGE when relevant.

Type of action	Research and Innovation Action
Deadline	**23 February 2022**
Expected EU contribution per project	EUR 3.50 million
Topic information	Link

Call – Sustainable, secure and competitive energy supply
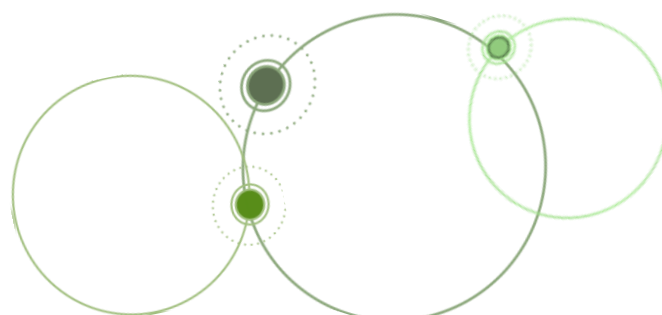
HORIZON-CL5-2021-D3-03-12: Innovation on floating wind energy deployment optimized for deep waters and different sea basins (Mediterranean Sea, Black Sea, Baltic Sea, North-east Atlantic Ocean)

Expected Outcome

Floating offshore wind has the potential to unleash a new European industrial sector able to deliver clean and sustainable energy. Building from European technological and industrial know-how and harnessing the natural resources of the different sea basins around the European Union, namely the Mediterranean Sea, the Black Sea, the Baltic Sea and the North-east Atlantic Ocean, there is an opportunity to leverage these conditions into technological leadership, while supporting the goal of climate neutrality. In this context, project results are expected to contribute to all of the following expected outcomes:

- Development or significant improvement of designs that reduce both CAPEX and OPEX;
- Deployment and demonstration of advanced full-scale floating wind turbines prototypes, and auxiliary equipment, in operational environment;
- Allow development of cost-efficient scalable solutions supporting exploitation of the renewable energy offshore potential in challenging conditions, while building upon innovative designs of floating structures and auxiliary equipment;
- Contribute to LCOE reduction in line with the SET Plan targets (actions should clearly justify an estimated LCOE at project start and end).

Scope

The proposal is expected to deploy in one of the possible sea basins in Europe.

Further, the proposal should:

- Demonstrate how innovations (materials, technologies, designs,…) on floating wind turbines, substructures, dynamic cables, control systems and moorings positively affect production;
- Demonstrate in real use scenario the improvements that the identified solutions contribute in terms of life expectancy, cost reductions, as well as operation and maintenance of a floating offshore wind installation;
- Demonstrate how the proposed innovations positively increase rate of deployment of offshore wind in deep seas, reducing capital, operational and maintenance costs, as well as present an industrial roadmap for a floating energy industrial sector, with focus on mass production;
- Document all demonstrations fully and transparently, to ensure replicability, up-scaling and to assist future planning decisions;
- Demonstrate a modular design suited to large-scale deployment in various environments, with special focus on industrial mass production;
- Ensure minimal environmental impact of these innovations, and address how Maritime Spatial Planning can be used to facilitate the identification and optimal use of suitable locations for floating wind platforms.

The proposal has to include a clear go/no go moment ahead of entering the deployment phase. Before this go/no-go moment, the project will have to deliver the detailed engineering plans, a complete business and implementation plan and all needed permits for the deployment of the project. The proposal is expected to clearly demonstrate a proposed pathway to obtaining necessary permits for the demonstration actions and allow for appropriate timelines to achieve these. The proposal is expected to also demonstrate how it will get a financial close for the whole action. Independent experts will assess all deliverables and will advise for the go/no-go decision.

The proposal should take a multi-disciplinary and multi-stakeholder approach, to ensure that different viewpoints and interests are taken into account in development and deployment processes and to help avoid foreseeable externalities. Thus, it requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. The selected projects are expected to contribute and participate to the activities of the project BRIDGE when relevant.

Type of action	Research and Innovation Action
Deadline	**23 February 2022**
Expected EU contribution per project	EUR 16.00 million
Topic information	Link
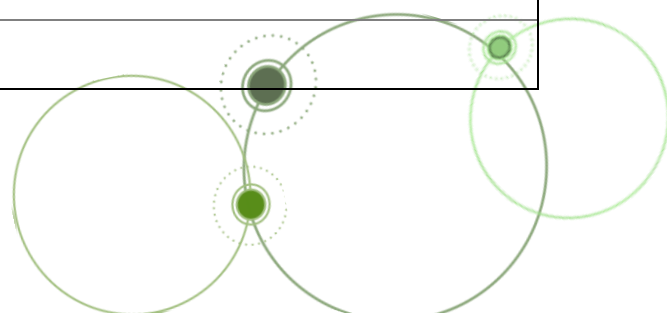
Call – **Sustainable, secure and competitive energy supply**

HORIZON-CL5-2021-D3-03-15: Solutions for more sustainable geothermal energy

Expected Outcome

Project results are expected to contribute to all of the following expected outcomes:

- Performance and reliability improvement of shallow and/or deep geothermal systems;
- Reduced environmental impact of geothermal plants;
- Reduced risk of seismicity;
- Increased citizen engagement for geothermal energy;
- Reduction of LCOE approaching SET Plan targets (actions should clearly justify estimated LCOE at project start and end);
- Energy efficient, environmentally sound, and economically viable generation of electricity, and/or heating and cooling from geothermal resources in a wide range of geological settings, enabling geothermal energy development in new regions and supporting application concepts for local energy supply.
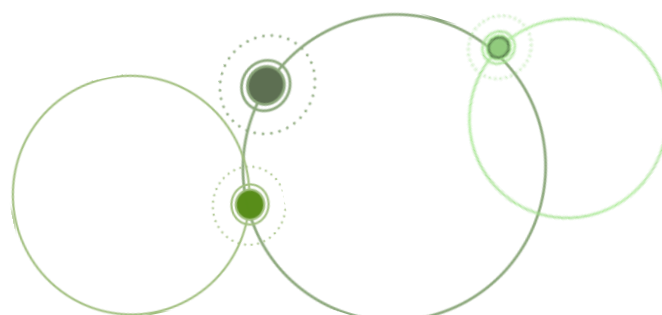
Scope

The proposal is expected to develop and validate innovative sustainable circular-by-design solutions that can reduce environmental impact and increase the overall circularity of geothermal energy. The following can be considered:

- Capture of greenhouse gases, storage or reinjection schemes for the development and exploitation of geothermal reservoirs, in particular those with high content of non-condensable gases (NCGs), and the use of alternative fluid to brine.
- Techniques for reservoir development and exploitation in a wider range of geological settings, including complex and/or untested geological conditions.
- Potential introduction and demonstration of the innovative technologies as part of existing geothermal plants in Europe and abroad.
- Novel methods and technologies to find and develop productivity from near magmatic, superhot/supercritical zones that are currently unexploitable and non-commercial.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities

Type of action	Research and Innovation Action
Deadline	**23 February 2022**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

HORIZON-CL5-2022-D3-01-01: Demonstration of cost-effective advanced biofuel technologies utilizing existing industrial plants

Expected Outcome

The cost-effective integration of advanced biofuel technologies in existing industrial plants will contribute to increase the competitiveness of these technologies and overcome the costly scaling-up of advanced biofuel production which requires heavy new infrastructure and investments and impedes their capacity building. It will thus allow high penetration of advanced biofuels in the transport energy system, in particular for hard to electrify sectors like aviation and maritime.

Project results are expected to contribute to all of the following expected outcomes:

- Reduce capital and operational expenses (CAPEX and OPEX) of advanced biofuel production facilities.

- De-risk technology, boost scale-up of advanced biofuels and contribute to their market up-take.

- Contribute to the priorities of the SET Plan Action.

- Respond to short and medium term needs for renewable fuels in transport.

- **Create win-win solutions for advanced biofuel production and conventional industrial phasing out plants, e.g., first generation biofuels, associated with socio-economic benefits.**

Scope

Proposals should demonstrate cost-efficient advanced biofuel technologies which improve the economic viability of the advanced biofuel production. This should be done through innovative transformation of existing plants to incorporate production of advanced biofuels from non-food/feed sustainable biomass feedstock into existing processes, e.g., first generation biofuel plants, paper mill industry, waste treatment plants, oil-refineries, petrochemical industry, etc. Integration of advanced biofuel processing should be done with new and innovative installations and it should be optimized implementing a circularity approach for energy and material, as well as digitalization as appropriate, e.g. by using sensors, smarter equipment, algorithms etc., to increase the efficiency, cost-effectiveness and performance of the final plant. **Economic advantages in terms of both capital and operational expenditure for commercialization of advanced biofuels through transformation, as well as socio-economic benefits for phasing-out industries including the impact on current first generation biofuel sites should be addressed. Proposals should provide information about the expected economic improvements and the potential of full transformation to advanced biofuel plants as appropriate.** All demonstrators should be fully and transparently documented, to ensure replicability, up-scaling and to assist future planning decisions.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Type of action	Innovation Action
Deadline	**26 April 2022**
Expected EU contribution per project	EUR 10.00 million
Topic information	Link

Call – **Sustainable, secure and competitive energy supply**
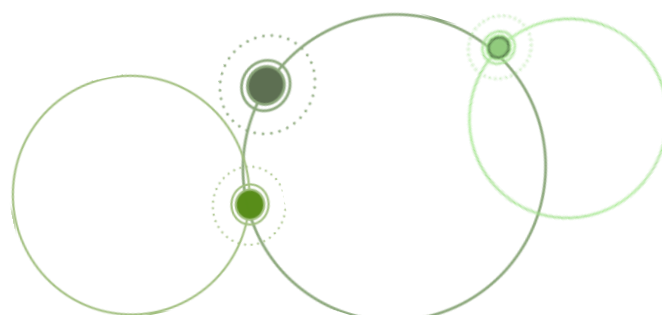
HORIZON-CL5-2022-D3-01-04: Demonstrate the use of high temperature geothermal reservoirs to provide energy storage for the energy system

Expected Outcome

Project results are expected to contribute to all of the following expected outcomes:

- Performance and reliability improvement of geothermal systems.
- Reduced environmental impact of geothermal plants.
- Increased citizen engagement.
- Reduction of LCOE approaching SET Plan targets (actions should clearly justify the estimated LCOE at project start and end).

Scope

High-temperature underground thermal energy storage (HT-UTES) covers the 25-90°C temperature range, and the targets of interest can reach up to 2000 m in depth. **The development of UTES is linked to a multidisciplinary understanding of the whole system, including waste-heat source, exploration and subsurface characterisation, production, implementation and distribution systems, as well as the adaptation of the regulatory framework and social acceptance**. The main technical challenges are the adaptation of the return temperature from the surface site to the subsurface temperature and to the regulatory frameworks, identification, characterisation and monitoring the reservoirs for UTES, the geo-mechanical effects of the reservoir linked to the seasonal injection/ production operations related to pressure and temperature changes, hydrogeochemical problems associated with scaling and corrosion of the piping system, circular design and optimisation of the distribution network.

The proposal is expected to:

- Develop and demonstrate appropriate control systems and infrastructure to manage geothermal heat and electricity production, heat demand and storage connected to the installation.
- Use the flexibility of geothermal reservoirs as thermal energy storage systems and flexibility in the network coping with daily, weekly and seasonal variations in heat demand.
- Demonstrate the innovative technologies in at least 2 different plants with different characteristics.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Type of action	Innovation Action
Deadline	**26 April 2022**
Expected EU contribution per project	EUR 20.00 million
Topic information	Link
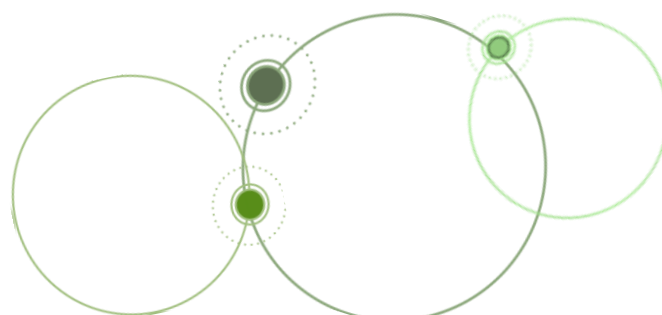
Call – Sustainable, secure and competitive energy supply

HORIZON-CL5-2022-D3-01-05: Demonstration of innovative plug-and play solutions for system management and renewables storage in off-grid applications

Expected Outcome

Project results are expected to contribute to some of the following expected outcomes:

- Advance the European innovative knowledge basis, technology base, technology leadership in the area of renewable energy-based off-grid energy systems, while creating evidence for policy making in the context of off-grid energy systems.

- **Improve environmental and socio-economic sustainability of the renewable-energy off-grid systems, particularly on geographic energy islands and/or in Africa and/or Central Asia**.

- Technology de-risk through prototype demonstration tested and validated in operational environment as a necessary step before scaling up at commercial level.

- Reinforce the European scientific and innovation basis through international collaboration on off-grid energy systems while increasing the potential to export European renewable energy technologies and ensuring political priorities.

Scope

Demonstration of innovative plug and play solutions for system management and renewables storage in off-grid applications, which allow for increase of renewables penetration for electricity and heating/cooling and are deployable under different climatic conditions, while also addressing cost-effectiveness, energy poverty and security of supply and by promoting prosumer renewable energy in off-grid cities and communities (including on geographic islands).

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Type of action	Innovation Action
Deadline	**26 April 2022**
Expected EU contribution per project	EUR 10.00 million
Topic information	Link
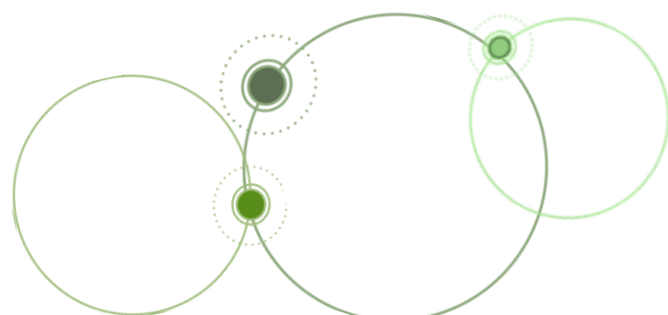
Call – **Sustainable, secure and competitive energy supply**

HORIZON-CL5-2022-D3-01-06: Novel Agro-Photovoltaic systems

Expected Outcome

Photovoltaic power generation is pivotal to a clean energy system and the achievement of the zero-emissions target. To that end, it is important to enhance affordability, sustainability and exploit the modularity and synergies of application of PV technologies. Consequently, project results are expected to contribute to all of the following outcomes:

- Harvesting of crops and photovoltaic electricity, providing sustainable solutions for energy production/use/efficiency, soil protection and water conservation.
- Reinforce the European PV value chain, introduce new business models and open new markets for novel Agro-Photovoltaic systems.
- Minimise the impact of PV on landscape and environment exploiting its modularity and synergies of use

Scope

Agro-Photovoltaics (or Agrivoltaics) denotes approaches to use agricultural areas simultaneously to produce crops and to generate PV electricity. In this way, Agro photovoltaics increases land-use efficiency and enables PV capacity to be expanded solving the problem of energy poverty in the agricultural sector, while still retaining fertile arable areas for agriculture.

The proposal should address all of the following:

- Develop and demonstrate agro-photovoltaic systems or building integrated agro-photovoltaic systems for green houses employing PV cell technologies/systems that allow and are adapted to appropriate growth conditions (plant variety and local geography) and at the same time produce electricity covering all year-through energy needs (e.g. for cooling/heating, watering, etc.) and increased crop yield.
- Demonstrate feasibility, reliability, replicability, robustness and ease of maintenance of the system and its performance using relevant KPIs (for e.g. ground coverage ratio, energy and agricultural yield, spatial efficiency, etc.).
- **Demonstrate a business case for the concept and market introduction strategy.**
- Address the following related aspects: low environmental impact (avoiding or minimizing land impact from PV systems), resource efficiency and circularity potential.
- **Include a strong involvement of citizens/civil society, together with academia/research, industry/SMEs and government/public authorities.**

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions, as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Type of action	Innovation Action
Deadline	**26 April 2022**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

Call – Sustainable, secure and competitive energy supply
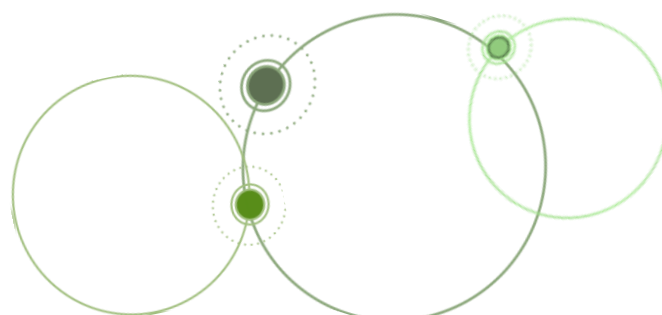
HORIZON-CL5-2022-D3-01-08: Supporting the action of consumers in the energy market and guide them to act as prosumers, communities and other active forms of active participation in the energy activities

Expected Outcome

Project results are expected to contribute to most of the following expected outcomes:

- Demonstrate in real life interactive communication and support tools to engage citizens in the energy transition and to support them throughout the process of creating, constituting and developing an energy community, that are developed and fine-tuned based on field-tests;

- Engagement of distributed active consumers and energy communities at broad scale, including through innovative incentive mechanisms;

- Enabled new market roles and market participants;

- Enabled automated participation;

- Residential and SME related Demand Response contributing to increased level of flexibility and to the development of new flexibility products;

- Identified drivers and rules beyond marginal pricing which can steer the transactions within the energy communities;

- Developing mechanisms to support the creation, growth and capacity building of energy communities.

Scope

The provisions of the Clean Energy Package have paved the way for a new, more active role of prosumers and energy communities in the electricity market. Innovative tools and tailored solutions should be developed and tested in order to fully enable new type of interactions between citizens as consumers, prosumers and (members of) energy communities and foster participation in energy (in particular electricity) markets. To this aim, projects should link citizens, technologies, regulation and markets together. Tools should be developed to support demonstration of the energy community paradigm shift within the mentioned context using suitable digital platforms for putting the citizens in direct contact with each other, suppliers, aggregators and other involved market stakeholders and to increase prosumers' satisfaction and participation. Dedicated demonstrations should be set to demonstrate the use of these interactive tools to contribute to real-time optimization of Distributed Energy Resources and the facilitation of investment decisions at household or community level in RES or demand response.

To get the acceptance of different energy technologies in civil society, these demonstrations should be built on SSH approach to take into account the social and behavioural dimension at the stage of their design, also considering safety issues of electrical systems. As a result, **these demonstrations are expected to aim to increase the understanding of consumer's behaviour** (e.g. by understanding how they are providing demand side flexibility as close as possible to real-time). They should also aim to create innovative tools and tailored solutions to empower prosumers, to help them to realise energy communities and finally pave the way for the energy transition. With these new insights the projects are expected to adapt the solution, test it again and compare the outcome of both iterations. The tested solutions should be able to reconciling the top-down market developments with the bottom-up changes in the market arrangement and participation. Solutions are expected to be as replicable as possible and to be demonstrated in a variety of geographical locations in different Member States/Associated Countries representing very different social and economic situations. **In addition, regulatory / administrative barriers and possible solutions should be assessed as part of the projects.**

To do so, projects are expected to design, develop and test incentives for market participants to react to system conditions according to location and time, while at the same time considering maximization of their economic benefit. Projects should develop the entire functional chain from data collection and elaboration, to local flexibility needs and user-centric compensation enabling the active participation of prosumers. Projects should take into account related ongoing activities under H2020 and Horizon Europe and are expected to contribute to relevant BRIDGE activities

Type of action	Innovation Action
Deadline	**26 April 2022**
Expected EU contribution per project	Between EUR 5.00 and 6.00 million
Topic information	Link
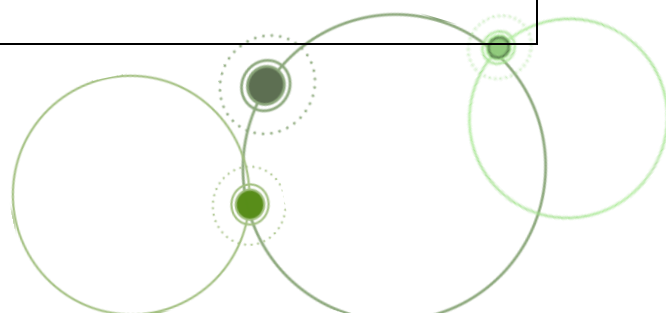
HORIZON-CL5-2022-D3-01-10: Interoperable solutions for flexibility services using distributed energy storage

Expected Outcome

Project results are expected to contribute to all] of the following expected outcomes:

- A new generation of energy management systems implemented to provide the capability of a hybrid energy storage systems (HESS) to work as a conventional battery energy storage system with enhanced performance. Hybrid energy storage systems can concern distributed sources of storage, such as EV Batteries, Home Batteries, or connection with the Heat Pumps.

- Agreeing in wide scope of stakeholders including EV community and other sources of storage (e.g. flexible heat pumps) on a common protocol that could connect different storage applications (Energy- Home management system, heat pumps, EVs).

- Validation of user acceptance, and demonstrating concepts that ensure privacy, liability, security and trust in connected data spaces.

- To encourage European citizens and businesses, especially SMEs to deploy storage, the ease of use and consequently interoperability are a must.

Scope

The objective is to develop interoperable distributed storage technology to enable the seamless utilization and monetization of storage flexibility within a real life environment. Pilots need to demonstrate innovative Battery Energy Storage Systems (BESS) and Hybrid Energy Storage Systems HESS solutions within the home, building, community and stand-alone and power grid connected together with TSO and/or DSO, including real-time data sharing and operation. At least 2 pilots, with different use cases (overall covering both BESS and HESS systems), should present interoperable solutions involving different types of BESS. The project(s) should facilitate HESS reaching a similar interoperability and Plug-and-Play capabilities of a BESS with extended performance by using virtualization techniques. A new generation of hybrid energy storage systems (HESS) that can efficiently operate with the combined capacities of the individual energy storage systems (ESS) that conform it. Hybrid energy storage systems can concern distributed sources of storage, such as EV Batteries, Home Batteries, or connection with the Heat Pumps. Real-time data sharing and operation should be ensured through aligning existing standards from the utility and ICT domains, across the devices and systems to enable innovative distributed storage services.

Deployment and adoption of IoT standards and platforms for distributed storage systems (stationary and electric vehicles) in Europe and development of cost-effective and sustainable European distributed storage ecosystems and related business models are expected. For example:

- Access of third parties to the minimum necessary data to perform aggregation functions should be looked at: which type of data could be made available for 3rd parties.

- Common solution between different stakeholder groups and different brands of devices should be looked at (for example storage from Heat Pumps requires coordination with several brands, so as to come up with a possible cross brands and cross sector solution).

- HESS dimensioning methodology depending on the application and integration conditions, including the selection of different European manufacturers ESS to conform the HESS, connection architecture, and control. Aspects of competition to be considered (include different manufacturers).

- Validation of the HESS integration in a real environment, demonstrating an efficient energy management, and the benefits of the combined capability of the individual ESS.

- Framework for use of data that may be considered as personal data generated by natural persons under the GDPR.

Common architecture models (Smart Grids Architecture Model - SGAM) and implementing standards (such as CEN-CENELEC, SAREF etc.) should be taken into account to ensure interoperability and compatibility. Highest (semantic) interoperability should be reached for all use cases of storage and cost of deployment of distributed storage is decreased. The need for standard harmonization across industry sectors should be explored, along with legislation and demonstration of scalability and stimulation of spill-over effects, for example towards applications beyond road transport.

Feedback mechanisms from the users should be envisaged to allow adaptation and optimisation of the technological and business approach to the particular use case. For all actions, the consortia have to involve and/or engage relevant stakeholders and market actors who are committed to adopting/implementing the results. The selected projects are expected to contribute to relevant BRIDGE activities. Projects should take into account existing interoperability related work of previous and ongoing H2020 and HE research projects such as INTERCONNECT.

Collaboration and synergies with the co-programmed European Partnership 2Zero are also expected. Areas will concern interoperable aspects of integration of storage from the EVs, including research on minimum data to be made ready for the third parties (for purpose of storage), e.g. HORIZON-CL5-2021-D5-01-03: System Approach for advanced Static Smart Charging: integration of EV with the infrastructure of the grid. Similarly, collaboration and synergies are expected with European Partnership "Towards a competitive European industrial battery value chain for stationary applications and e-mobility".

Call – **Sustainable, secure and competitive energy supply**

Areas concern battery management system and operation data (e.g. HORIZON-CL5-2021-D2-01-06: Physics and data-based battery management for optimised battery utilisation), and complementarities where integration of battery systems into larger systems is not tackled (e.g. HORIZON-CL5-2022-D2-01-05: Next generation technologies for High-performance and safe-by-design battery systems for transport and mobile applications), will also be expected.

This topic will benefit from the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. The Commission will make sure that projects benefit from SSH expertise through the cooperation in Bridge.

Type of action	Innovation Action
Deadline	**26 April 2022**
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link

HORIZON-CL5-2022-D3-01-12: Replicable solutions for a cross sector compliant energy ecosystem

Expected Outcome

Project results are expected to contribute to most of the following expected outcomes:

- A catalogue of services and flexibility potential of appliances tailor-made for specific consumer groups, as well as the accompanying IT-tools that can help them providing flexibility services to the energy market and system.
- Increase participation of energy consumers in demand side flexibility markets by reducing entry barriers and transaction cost, in particular in relation to data exchange and market access.
- Provide viable interoperable solutions and products, available to all levels of the grid including within the home, which makes it simple to increase flexibility in energy consumption and have a positive impact in balancing demand/response with an increasing share of renewable energy sources.
- Create a vibrant cross-sector ecosystem, successfully mobilising demand-response and demonstrating opportunities for new services provided by SMEs and start-ups.
- Create sustainable marketplaces based on a comprehensive catalogue of energy smart appliances (home appliances including EV charging and distributed energy storage), services and hardware/software solutions compliant with a set of standards for Minimum Interoperability.
- Demonstrate the potential for a sustainable up-take (coordinated across all projects from the call) based on components and solutions piloted in real life.

Scope

Promote the adoption and usage of connected interoperable energy smart home appliances (including the EV charging and home storage) and solutions in order to accelerate the deployment of demand-side flexibility services, reduce the entry barrier and facilitate replication.

- Identify a set of open standards for Minimum Interoperability based on the results of multiple research and innovation projects and existing technological developments as well as already available open standards and/or open source solutions to enable energy smart appliances and solutions to participate in demand side flexibility.
- Provide new business models supported by innovative interoperable solutions enabled by connecting systems from different sectors.
- Test interoperable services/solutions based on a reference architecture and minimum interoperability mechanisms that can enable flexibility.
- The solutions initially developed in a pilot in one country will have to be tested, in real life, in at least two other countries, with different energy constraints, by different entities. The overall target is replication in as many Member States/Associated Countries as possible.
- Create and populate a commonly agreed catalogue of energy smart home appliances (including EV charging and storage), services and hardware/software solutions compliant to a set of standards for Minimum Interoperability.
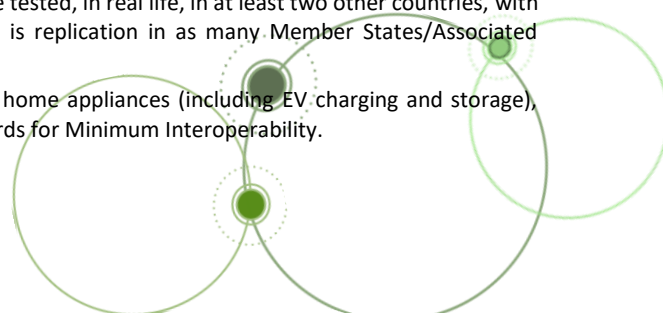
Call – Sustainable, secure and competitive energy supply

- The call is open to all stakeholders. For instance, utilities, ESCO/aggregators, appliances manufacturers, energy cooperatives, retailers owning buildings (heating/cooling) in many cities, office building that in their parkings offer eV chargers, water treatment plants, public buildings, schools, ICT companies, system integrators, Data Centre operators, EV manufacturers, storage providers, industry and other relevant stakeholders with a role in the energy flexibility market.

- The projects should support the proliferation of innovative energy and energy services markets building on interoperable solutions that can be tailored easily to the type or need of users. **Therefore the projects should take into account the social and behavioural dimensions of consumer's participation and to get the acceptance of different energy technologies.**

- The solutions are expected to adapt digital technologies to the specificities and requirements of the energy system (Artificial Intelligence, Big Data, 5G, cloud/edge computing, Internet of Things ...).

- While complying with cybersecurity requirements privacy issues are to be specifically considered. They have to be built on open architectures and commonly agreed standards derived from these technologies (such as SAREF) and relevant European and Global ICT and Energy Standards Development Organisation and associations

- The selected projects will cooperate among themselves and with other relevant projects through regular common workshops, exchange of non-confidential reports, etc.

The selected projects are expected to contribute to relevant BRIDGE activities.

Type of action	Innovation Action
Deadline	**26 April 2022**
Expected EU contribution per project	Between EUR 8.00 and 9.00 million
Topic information	Link
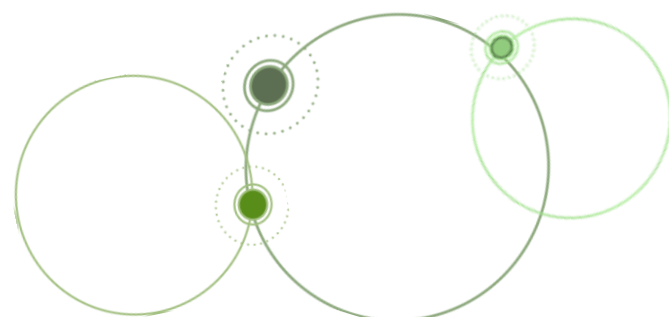
HORIZON-CL5-2022-D3-01-15: Decarbonising industry with CCUS

Expected Outcome

Successful, safe and economic demonstration of integrated-chain CCUS from relevant industrial sources will pave the way for subsequent first-of-a-kind industrial projects. The scale of the proposals should permit obtaining relevant data and experience required so that up-scaling to a first-of-a-kind plant can be envisaged as a next step. The impact of projects under this call will be determined by the extent to which the results will be extended to be used in further industrial facilities. In addition, it is important to demonstrate how the captured CO_2 will be utilised and/or stored in a sustainable way. Projects carried out in areas with a sufficient concentration of CO_2 emitting industries are considered prime sites for hub and cluster developments, and are expected to generate the highest impact on full-scale deployment of the results.

Scope

CCUS is one of the key promising technologies that can reduce CO_2 emissions in the carbon intensive industry and the only pathway for very stringent GHG emission reductions from those industries that generate CO_2 as part of their production processes. Relevant industrial sectors in which inclusion of CCUS could contribute to reaching climate neutrality are for example steel, iron and cement making, oil refining, gas processing, hydrogen production, sustainable biofuel production and waste-to-energy plants. However, CCUS in industrial applications faces significant challenges due to its high cost and the fierce international competition in the sectors concerned. These sectors currently account for up to 20% of global CO_2 emissions.

The focus of this topic lies in demonstrating the integrated chain of mature CO_2 capture technologies in industrial facilities with the perspective of geological storage and/or use. Based on a high TRL (7 – 8) CO_2 capture project a detailed plan on how to use the results, i.e. the subsequent transport, utilisation and/or underground storage of the captured CO_2 should be developed. **Important aspects to address are of technical** (e.g. the optimised integration of capture plant with industrial processes; flexibility, scalability; CO_2 purity), **safety** (e.g. during transportation and storage**), financial (e.g. cost of capture; cost of integration) and strategic nature (e.g. business models; operation and logistics of industrial clusters and networks).** The project should identify a detailed set of operational, environmental, technical and economic Key Performance Indicators (KPIs) to allow monitoring and assessing the progress achieved by the project.

Technology development has to be balanced by an assessment of the societal readiness towards the proposed innovations. Relevant end users and societal stakeholders (such as civil society organisations, non-governmental organisations, and local associations) will be identified in the proposal, and involved in deliberative activities, so as understand and address their concerns and needs. This will be analysed during the project using appropriate techniques and methods from the social sciences and humanities, in order to create awareness, gain feedback on societal impact and advancing society's readiness for the proposed solutions. Projects should also explore the socio-economic and political barriers to acceptance and awareness with a view to regulatory or policy initiatives and include aspects of circularity and best use of resources. Successful projects will be encouraged to join the EU CCUS knowledge sharing project network.

Type of action	Innovation Action
Deadline	**26 April 2022**
Expected EU contribution per project	EUR 29.00 million
Topic information	[Link](#)

Call – **Sustainable, secure and competitive energy supply**
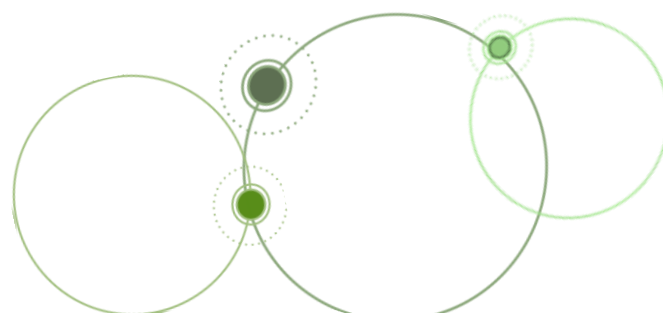
HORIZON-CL5-2022-D3-02-07: Renewable energy incorporation in agriculture and forestry

Expected Outcome

Meeting local and seasonal energy demands in agriculture and forestry with optimum agricultural and forest waste management and use while reducing the associated emissions is essential. If not managed, agricultural waste is often burnt in the fields and forests suffer from fires, thus increasing the environmental footprint of agriculture and forests. Soil and biodiversity improvement in agriculture could also benefit from renewable energy technologies. Demonstrating incorporation of renewable energy technologies to attain heat, waste and land management needs in agricultural and forestry will contribute to increase the penetration of renewable sources in the energy system and enable transformation of the energy supply across critical energy-consuming sectors, thus accelerating the achievement of the European Green Deal and climate and energy targets for 2030 and of net zero greenhouse gas emissions by 2050, while supporting the EU goals for energy independence and economic growth. Furthermore, it will support achieving the specific objective of the post 2020 Common Agricultural Policy regarding contribution to climate change mitigation and adaptation, as well as sustainable energy.

Project results are expected to contribute to some of the following expected outcomes:

- Promote decentralised renewable energy use and cost-efficient decentralized production of renewable energy carriers.
- Reduce agriculture and forestry carbon footprint from own energy consumption and agricultural/forest waste management.
- Increase sustainability and circularity in agriculture while creating positive effects on biodiversity.
- Increase sustainability and circularity in forestry.
- Foster regional development in rural areas.
- Support farmers' and foresters' engagement as prosumers of renewable energy.

Scope

Proposals should demonstrate incorporation of renewable energy technologies in agriculture or forestry to meet its electricity, heat, cold, waste and land management needs. Solutions should combine innovative renewable, circular and regional value chains from different renewables and adapted storage options to de-fossilize agricultural or forest processes trans-seasonally, taking into account hybridization compatibility.

They should also address one of the two options:

- Transformation of agricultural or forest wastes to renewable energy carriers in situ, e.g. by modular slow pyrolysis units, using renewable energy for process energy needs. Solutions should improve the cost-effectiveness and the sustainability of agriculture or forest seasonal energy demand based on renewables.

- Development of renewable-based agricultural protocols for multiple and cover cropping and/ or mixed cropping which increase carbon sequestration and soil organic matter and reduce pesticides, combined with transformation to renewable energy carriers in situ, e.g. by biogas production, in a circular approach for soil nutrients and carbon. Positive effects on soil biodiversity/soil health and soil functionality as regards increasing soil organic matter, phosphorus and other nutrients and reducing the risk on groundwater contamination from nitrogen oxides should be assessed. Solutions should improve the cost-effectiveness and the sustainability (including biodiversity) of agricultural waste and land management through valorisation of wastes and secondary crops based on renewable energy technologies.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. The effective contribution of renewable energy and agronomy disciplines is also expected.

Type of action	Innovation Action
Deadline	**27 October 2022**
Expected EU contribution per project	EUR 7.50 million
Topic information	Link

Call – Sustainable, secure and competitive energy supply
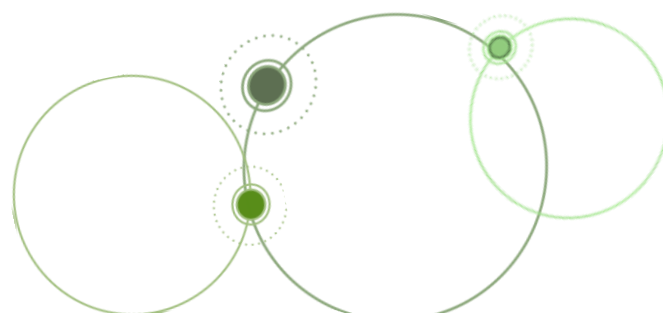
Topics with minor SSH relevance

HORIZON-CL5-2021-D3-02-08: Electricity system reliability and resilience by design: High-Voltage, Direct Current (HVDC)-based systems and solutions

Link

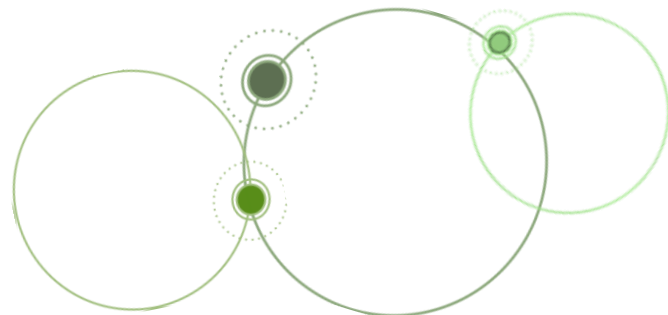**HORIZON-CL5-2021-D3-02-12: Integration of CCUS in hubs and clusters, including knowledge sharing activities**

Link

HORIZON-CL5-2022-D3-02-05: Renewable energy carriers from variable renewable electricity surplus and carbon emissions from energy consuming sectors

Link

HORIZON-CL5-2022-D4-01-01: Demand response in energy-efficient residential buildings

Expected Outcome

Project results are expected to contribute to all of the following expected outcomes:

- **Increased potential benefits, trust and acceptability of demand-response solutions for residential consumers.**

- Advanced asset control and aggregation approaches that enable the participation of residential buildings in commercial demand response.

- Expanded pool of assets relevant for demand response in the residential sector.

Scope

Address the large but untapped potential of the residential sector for Demand Response with a view to support the energy transition at system level while respecting user privacy, comfort and ownership. Proposals should:

- Investigate innovative demand response solutions for the residential sector, including new control modes and asset optimisation techniques involving as many devices as possible.

- Ensure that the proposed solutions comply with the principle of privacy by design and with best practices on data protection.

- Ensure that the proposed solutions allow to minimise the effort required to elicit user preferences, also investigating innovative approaches for user segmentation and engagement.

- **Take due account the regulatory frameworks of the regions / countries in which the proposed solutions could be deployed** in designing their innovation, and shaping related exploitation activities.

- **Seek to the best consideration of social and economic enablers in the design of the innovative solutions**.

- **Consider social innovations, notably as new tools, ideas and methods leading to active citizen engagement and as drivers of social change, social ownership, and new social practices.**

- Demonstrate that the proposed solutions lead to reducing costs of small demand response assets e.g. through improved models and faster data processing and, are scalable and replicable.

- Demonstrate that the proposed solutions are suitable for explicit demand response, or a combination of both explicit and implicit residential demand response. Each project is expected to include at least three demonstration sites located in different climatic regions.

The selected projects are expected to contribute to relevant BRIDGE activities, in particular with respect to data exchange and interoperability. Clustering and cooperation with other relevant projects is strongly encouraged; in particular, liaison and synergies with the European Partnership on 'People-centric sustainable built environment'.

Type of action	Innovation Action
Deadline	**06 September 2022**
Expected EU contribution per project	Between EUR 4.00 and 6.00
Topic information	Link

Call – **Efficient, sustainable and inclusive energy use**
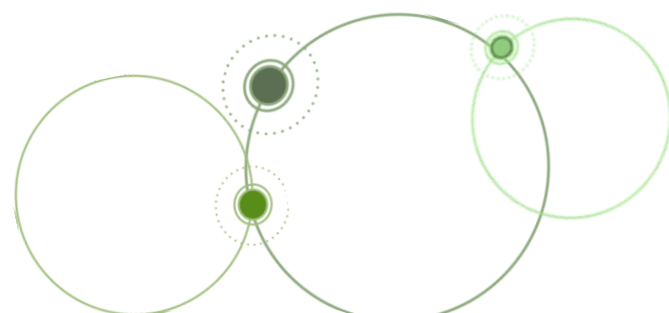
HORIZON-CL5-2022-D4-02-01: Designs, materials and solutions to improve resilience, preparedness & responsiveness of the built environment for climate adaptation (Built4People)

Expected Outcome

Project results are expected to contribute to all of the following expected outcomes:

- Increased awareness of the built environment's protective role for people and climate adaptation in case of disruptive events.

- Mainstreamed resilience as a key feature of the built environment across its life cycle.

- Improved ability of the built environment to support the preparedness and responsiveness to disruptive events at larger scales.

- Improved ability of the built environment to contribute to the overall quality of living and working.

- Strengthened supply chains for materials and solutions for a resilient and climate proof built environment, adapted to local risks.

Scope

The proposal should:

- Deliver innovative designs, materials and solutions to improve resilience and climate proofing of the built environment (in particular new and existing buildings) in a cost-effective and reliable manner.

- Ensure the proposed solutions cover a broad spectrum of natural risks and disasters, for instance natural disruptive events such as earthquakes, floods, heat waves, with a particular focus on extreme climatic events.

- Ensure the proposed solutions make use of natural, easy to manage, as well as advanced, evolutive materials and technologies that help combat the effects of global warming (increased cooling demand, heat island effects, etc.) and result in increased durability, resilience and adaptability of buildings and infrastructures, including their foundations.

- **Consider social innovation where relevant, notably as new tools, ideas and methods leading to active citizen engagement and resilience, and as drivers of social change, social ownership, and new social practices.**

- Develop and deploy digital and interoperable tools for monitoring, detection of, and response to critical situations (e.g. evacuation of people and first responders).

- Rely, where relevant, on self-sensing and adaptable materials, and materials with embedded sensors and actuators.

- Include, as part of the proposed solutions, built environment concepts that are self-sustained for a certain period of time – including off-grid electricity supply, green infrastructure and water purification and / or rain water provision in buildings.

- **Where relevant, investigate whether and how the proposed approaches could apply to cultural heritage buildings across different typologies and geographic conditions, also including innovations in business models and ensuring holistic integration of disciplines across the value chain**.

- Validate the proposed solutions for a set of locations that is coherent with the risks and disasters considered in the proposal, ensuring a high degree of awareness and involvement of supply chains.

- Demonstrate that the proposed solutions improve the protection of people when experiencing disruptive events and contribute to enhance resilience and climate proofing at a larger scale (e.g. district, city, energy system).

- Demonstrate that the proposed solutions contribute to improving the overall quality of living and working in the buildings (e.g. in terms of accessibility, comfort and well-being).

- Demonstrate cost-effective improvement of the energy performance, reducing the cost of the interventions compared to traditional methods, as well as the energy related operational costs after the renovation.

- Demonstrate that the proposed solutions improve the use of relevant data such as weather forecasts or catastrophe warnings by monitoring and management systems in the built environment (e.g. to launch automatic emergency protocols to warn and protect buildings users).

- Lead at least 3 large-scale demonstration of the solutions in diverse geographical areas, with various local environmental, social, and economic conditions. Clustering and cooperation with other relevant projects is strongly encouraged; e.g. with the Horizon Europe Partnership on 'Driving urban transitions'.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. For this topic, projects are encouraged to define and implement ambitious international outreach and cooperation strategies. This topic implements the co-programmed European Partnership on 'People-centric, Sustainable Built Environment' (Built4People).
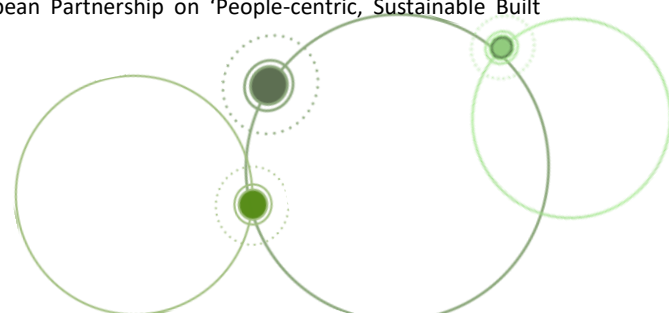
Call – Efficient, sustainable and inclusive energy use

Type of action	Innovation Action
Deadline	**24 January 2023**
Expected EU contribution per project	Between EUR 5.00 and 7.50 million
Topic information	Link

HORIZON-CL5-2022-D4-02-02: Solutions for the sustainable, resilient, inclusive and accessible regeneration of neighbourhoods enabling low carbon footprint lifestyles and businesses (Built4People)

<u>Expected Outcome</u>
Project results are expected to contribute to all of the following expected outcomes:

- Lasting behavioural change of people and economic actors towards lower carbon footprint lifestyles and businesses.
- Mainstreamed participatory planning processes and interaction with all relevant stakeholder groups in city planning.
- More sustainable, low emission, inclusive and affordable neighbourhoods and built environment.
- Improved accessibility of neighbourhoods through building-integrated, sustainable mobility solutions.
- Extended application of digital applications and tools to ease decision-making processes in complex stakeholder structures.
- Raised awareness and increased capacity of citizens on participatory processes for enhanced sustainability and environmental performance.
- Increased well-being and economic prosperity of citizens in a low carbon, sustainable built environment by ensuring high indoor and outdoor quality, and affordability of renovation solutions.
- Increased attractiveness of deep renovation through new regeneration and smart growth models for sustainable living.

<u>Scope</u>
The proposal should:

- **Deliver innovative methods and solutions for the regeneration of neighbourhoods, with due consideration of, inter alia, energy efficiency, sustainability, resilience, health, inclusiveness and accessibility, based on participatory planning processes and innovative decision-making procedures and digital applications.**
- Ensure the proposed solutions allow to identify and integrate local sources of raw materials for building renovation in built environment planning scenarios.
- Ensure the proposed solutions include new evidence-based approaches (e.g. strategies and digital tools) to help quantify the benefits of integrated built environment transformation aimed at climate neutrality.
- Ensure the proposed solutions allow for involving all stakeholder groups, including inter alia elderly people, those with reduced mobility and persons with disabilities, and households affected by energy poverty, also seeking to address gentrification issues in neighbourhoods affected by energy poverty.
- Ensure the proposed solutions include concepts for local renewable energy generation and consumption integrated at building and district level in combination with multi-modal mobility concepts targeted to both urban and rural neighbourhoods.
- Ensure the proposed solutions contribute to optimising energy balancing at local level (e.g. thanks to energy sharing platforms and services connected to local micro-grids and / or virtual energy markets, including demand response and decision-support systems and block chain applications).
- Ensure the proposed solutions comply with the principles of circular economy, favouring urban mining, efficient use of resources, durability, reuse and recyclability.
- **Ensure the proposed solutions are developed taking into account local environmental, social, and economic conditions and are relevant for the different geographical locations targeted.**
- Where relevant, include concepts for energy circularity such as waste heat recovery from local industries (or other sources) and use in nearby buildings or in low-temperature district networks and, valorisation of by-products and residues (e.g. from local agro-food industry) for energy or other uses.
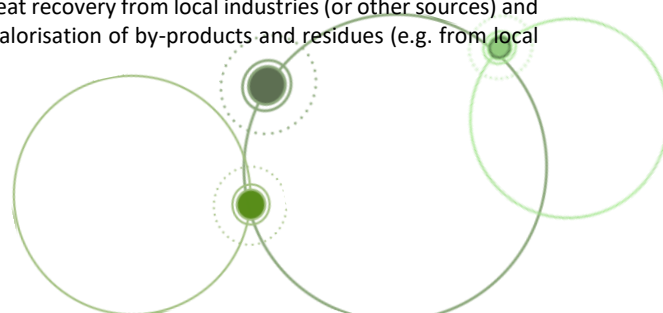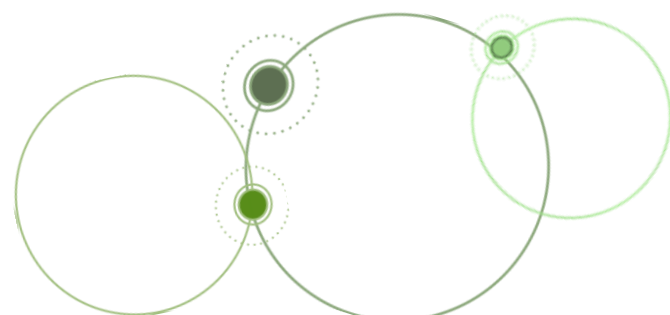
- **Where relevant, investigate whether and how the proposed approaches could apply to cultural heritage buildings.**
- **Lead at least 3 large-scale demonstrations of the solutions in diverse geographical areas, with various local environmental, social, and economic conditions**.
- **Consider social innovation where relevant and in the case where the proposed solutions are at the socio-technical interface and require social change, new social practices, social ownership or market uptake.**
- Facilitate awareness raising and capacity building of citizens and relevant stakeholders (e.g. citizen associations, local authorities, businesses from the relevant sectors) on the principles and multi-benefits of sustainable, inclusive and accessible built environment.

Clustering and cooperation with other relevant projects is strongly encouraged; e.g. with the European Partnership on 'Driving urban transitions'.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. This topic implements the co-programmed European Partnership on 'People-centric, Sustainable Built Environment' (Built4People).

Type of action	Innovation Action
Deadline	**24 January 2023**
Expected EU contribution per project	Between EUR 5.00 and 7.50 million
Topic information	Link

Call – **Efficient, sustainable and inclusive energy use**

HORIZON-CL5-2022-D4-02-03: Sustainable and resource-efficient solutions for an open, accessible, inclusive, resilient and low-emission cultural heritage: prevention, monitoring, management, maintenance, and renovation (Built4People)

<u>Expected Outcome</u>
Project results are expected to contribute to all of the following expected outcomes:

- Increased availability and enhanced overall performance, including with regard to cost-effectiveness, of solutions applicable to the reliable and respectful historical renovation of heritage buildings, preserving their architectural and cultural identity.

- Demonstrated potential of sustainable, energy and resource-efficient historical renovation of heritage buildings.

- Better protection of the value and long-term inclusiveness, accessibility and usability of cultural heritage sites.

- More cost-effective and less disruptive modernisation and preservation of the heritage built environment.

- Enhanced prevention and monitoring of the heritage built environment.

- More important role of the cultural heritage in deployment, showcasing and replication of solutions for a sustainable built environment.

<u>Scope</u>
The proposal should:

- **Deliver technically and socially innovative, sustainable, energy and resource-efficient solutions for the cost-effective improvement and preservation of cultural heritage built environment along all relevant aspects: inclusiveness, accessibility, resilience, environmental and energy performance.**

- Ensure the proposed solutions cover all relevant aspects of the heritage built environment's life cycle: design, renovation works, operation, monitoring and management, and maintenance.

- **Ensure the proposed solutions allow to maintain the heritage value (e.g. artistic, historic, archaeological, social and scientific) of targeted sites, while improving access and comfort of users and visitors, and reducing maintenance and operational costs**.

- **Ensure, where relevant, that the proposed solutions rely on (adapted) historical or traditional construction techniques and materials for sustainable restoration.**

- Ensure the proposed solutions include natural low maintenance as well as advanced renovation techniques for high quality design and construction, including new digital technologies, while preserving the cultural value of the targeted sites.

- Ensure the proposed solutions contribute to facilitate the integration renewable energy sources while respecting the aesthetic and cultural identity of the targeted buildings.

- Ensure the proposed solutions contribute to the cost-effective improvement of the energy performance, also reducing the cost of the interventions compared to traditional methods.

- **Ensure the involvement of relevant stakeholder groups (e.g. civil society organisations, associations, cultural heritage stakeholders such as cultural heritage protection bodies) and citizens' acceptance thanks to co-creation processes and socially innovative ideas.**

- Deliver and demonstrate decision-support tools for low-disruptive, optimal renovation of heritage built environment to enhance sustainability.

- Clustering and cooperation with other relevant projects is strongly encouraged; e.g. with the Horizon Europe Partnership on 'Driving urban transitions'.

- **This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.**

This topic should consider social innovation as driver of social change, new social practices, social ownership and/or market uptake. This topic implements the co-programmed European Partnership on 'People-centric, Sustainable Built Environment' (Built4People).
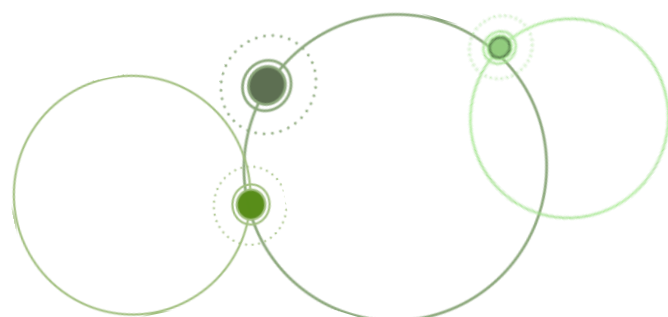
Call – Efficient, sustainable and inclusive energy use

Type of action	Research and Innovation Action
Deadline	**24 January 2023**
Expected EU contribution per project	Between EUR 4.00 and 5.00 million
Topic information	Link
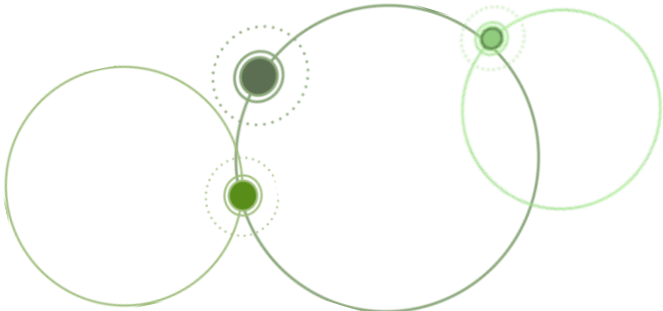
Call – Efficient, sustainable and inclusive energy use

HORIZON-CL5-2022-D4-02-04: Smart-grid ready and smart-network ready buildings, acting as active utility nodes (Built4People)

Expected Outcome

Project results are expected to contribute to all of the following expected outcomes from the grid and to adapt their behaviour accordingly;

- Improved interoperability and synergies between electricity and other energy carriers, and with other relevant non-energy sectors (e.g. mobility), supported by buildings, contribution to energy system integration at building's level.

- Improved competitiveness of buildings as flexibility assets for grid and network management.

Scope

The proposals should:

- Deliver building-to-grid integration solutions that are cost-effective, simple to use and easy to install and maintain, and are applicable to both new and existing buildings.

- Enhance interoperability and synergies between buildings and grids, electricity and other energy carriers (e.g. district heating networks, hydrogen, etc.) and where relevant, other relevant sectors (e.g. e-mobility).

- Enhance synergies between on-site energy storage and on-site renewable energy sources.

- Contribute to enhance interoperability in the modelling of energy grids and buildings.

- Ensure the proposed solutions include 'big data' applications for real-time management and predictive maintenance of technical building systems.

- Ensure the proposed solutions minimise potential negative impacts neither on the satisfaction of building users (e.g. in relation to comfort or accessibility) nor on the potential of circular material flows during the building's life cycle, and maximise potential benefits (e.g. energy costs savings and health).

- Ensure the proposed solutions give access to accessible, inclusive, reliable and user-friendly tools with limited maintenance needs and, to relevant building (and grid / network) data for interested stakeholders (e.g. facility managers).

- Assess the contribution of proposed solutions to the enhancement of smart readiness of buildings as rated by the smart readiness indicator under Directive 2010/31/EU.

- Where relevant, rely on advanced monitoring and management solutions such as those that integrate digital models / BIM with energy modelling and simulation at building level and district level.

- Implement and demonstrate innovative and competitive balancing, storage and generation services in buildings, while maximising building users' and occupants' health, comfort and satisfaction.

- **Demonstrate cost-effectiveness and economic viability of the proposed solutions and underlying business models for both consumers / end-users and the economic actors involved.**

- Demonstrate the use of large-scale interoperable platforms that bring together different actors and sectors (ESCOs, aggregators, DSOs, etc.) to exchange data and develop services.

- **Seek to involve major European innovators, including social innovators, in relevant fields (demand response, communications, smart appliances, building services, facility management, energy services, etc.) with limited experience of Horizon 2020.**

Clustering and cooperation with relevant projects is strongly encouraged; e.g. with the European Partnership on 'Driving urban transitions'. The selected projects are expected to contribute to relevant BRIDGE activities, in particular with respect to data exchange and interoperability. This topic implements the co-programmed European Partnership on 'People-centric, Sustainable Built Environment' (Built4People).

Type of action	Innovation Action
Deadline	**24 January 2023**
Expected EU contribution per project	Between EUR 6.00 and 9.00 million
Topic information	Link
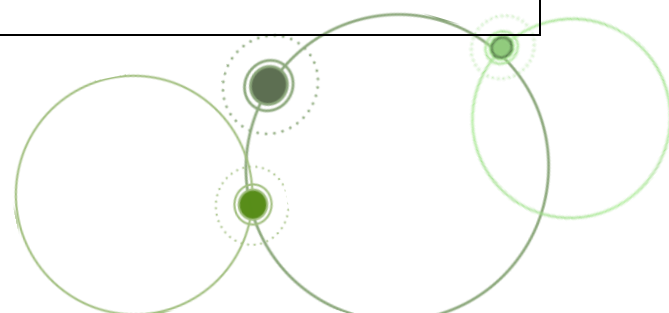
Call – Clean and competitive solutions for all transport modes

HORIZON-CL5-2022-D5-01-10: New generation of full electric urban and peri-urban Bus Rapid Transit systems to strengthen climate-friendly mass transport (2ZERO)

Expected Outcome

Projects' results are expected to contribute to all of the following expected outcomes:

- Development of next generation innovative effective public transport systems concepts using full electric buses (M3) through e-BRT.

- Present efficient, economically viable and flexible, integrated solutions of e-BRT within existing mass transport networks (all modes) and with personal mobility solutions (walk, bike, powered two-wheelers, cars etc.).

- Develop innovative, integrated, infrastructure solutions combining charging, bus-stops and dedicated bus lines, for both urban and peri-urban road networks.

- Development of flexible bus transport, end-user solutions, for both urban use in dense city centres and for less populated peri-urban environments, meeting future user demands of convenience, efficiency, safety and security.

- Development of an international market for European e-BRT systems, in particular, in countries with low offer of public transport with challenging conditions (climate, environment, poverty, etc.).

- Reduction of greenhouse gas and pollutant emissions as well as traffic congestion, by demonstrating the developed technologies and advanced electrified Bus Rapid Transit (e-BRT) concepts in European and in developing countries' partner countries cities.

Scope

The scale-up phase of clean and intelligent city buses should cover the most demanding routes, by switching the longest, fastest and busiest routes to electricity. Therefore, the investment in innovations in city buses (e.g. clean propulsion) can be optimized through BRT systems, as the operations can be planned, mileage is known and energy requirements can be predicted on-board since the roads and distances are familiar. As such, revisiting the concept of BRT with new, enabling technologies and solutions offers a key opportunity to reduce the carbon footprint of the transport sector, particularly in cities. Demonstration and testing in real operation are expected to be developed in four or five different European cities and at least one city in a partner country in a developing context either in Africa or in the region of Latin American and Caribbean countries. The demonstration activities should include mega-cities, larger/smaller cities and the link to peri-urban, inter-urban and sub-urban dwellings in order to afford complementary solutions in test and demonstrations. Zero tailpipe emission buses and their related infrastructure are expected to be applied in BRT lines, in different city contexts, together with the needed integration of e-BRT with other mass-public transport systems, and with personal mobility solutions. Solutions include both the physical vehicles, recharging infrastructure and the overall services offering.

Proposals are expected to address all the following:

- Electrification combined with automation and connectivity enablers, to optimize and validate the whole advanced BRT system.

- Operational concepts: increasing the capacity use rate; the average commercial speed; punctuality / regularity.

- Synchronization with other city transport modes; service quality whilst reducing CO_2 emissions, and cost per km/passenger.

- Replicability: use of the e-BRT technology under environmental, infrastructure and social conditions different from the European ones. The focus of projects is expected to be on mass transport, full electric Bus Rapid Transit (e-BRT) systems using full size buses (M3). Vehicle, infrastructure and operational aspects have to be addressed, considering charging systems for stationary, opportunity and Electric Road Systems (ERS) for buses (wireless, contact, SRS etc.) and strategies (IMC, Opportunity at stops or terminal, offline charging etc.).

Proposals are expected to take into consideration the transport operators' and transport authorities' needs for financial viability, effectiveness, flexibility, environment conformance, safety and security. The impact of e-BRT technologies on bus performance and on the frequency of necessary repair and maintenance work, the life duration of the bus, and the costs that have to be covered at the end of the life (recycling; upgrading etc.) might have a huge influence on the financial side and should, therefore, also be covered. The impact of the solutions implemented in the different cities in terms of GHG emissions and traffic should also be quantified. Guidelines for regional and international replication conditions to reach out a larger number of cities and countries are expected to be developed.

This topic requires the effective contribution of Social Sciences and Humanities (SSH) disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. Indeed, crosscutting issues related to socio-economic, gender, socio-cultural, and user aspects need to be addressed with the development of e-BRT systems in cities, taking into account location-specific characteristics of the implementation area, such as local policy targets, population density, and cultural matters. This will help at a better understanding and greater acceptability of such systems as well as socioeconomic benefits.
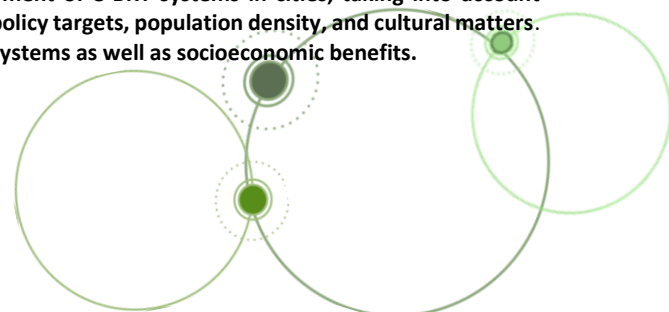
Call – Clean and competitive solutions for all transport modes

In line with the strategy for EU international cooperation in research and innovation, international cooperation is encouraged. This topic implements the co-programmed European Partnerships on 'Towards zero emission road transport' (2ZERO).

Type of action	Innovation Action
Deadline	**26 April 2022**
Expected EU contribution per project	Between EUR 20.00 and 25.00 million
Topic information	Link

HORIZON-CL5-2022-D6-01-01: European demonstrators for integrated shared automated mobility solutions for people and goods (CCAM Partnership)

Expected Outcome
Project results are expected to contribute to all of the following expected outcomes:

- Demonstration of inclusive, user-oriented and well-integrated shared CCAM systems and services for people and goods in real traffic conditions, which contribute to
  - reduced carbon footprint and harmful emissions;
  - reduced congestion, more reliable, predictive travel times and more efficient transport operations; o Increased safety and security;
  - End-users' adoption for specific use cases of innovative shared mobility solutions.

- Demonstration of innovative cross-sector business models and partnerships for CCAM.

- Assessment of all impacts of shared CCAM solutions in real world conditions, specifically on sustainability, inclusiveness and safety based on viable economic use cases for passengers and goods.

Scope
CCAM solutions have to provide a more user-centred, all-inclusive road mobility, while increasing safety, reducing congestion, emissions and contributing to climate neutrality. These novel mobility services enable seamless integration with existing services (e.g. public transport, logistics), and higher levels of automation support, transport productivity and efficiency (e.g. transportation of goods at lower speeds to save energy, operational efficiency at logistics hubs and in hub to hub corridors or last mile operations). Yet all these benefits need to be proven. Previous and currently ongoing demonstration projects for CCAM systems and services show, that further testing of highly automated systems and services with high scaling potential is necessary, involving more mature technologies or additional use cases in extended Operational Design Domains (ODDs). Proposed actions for this topic are expected to address all the following aspects:

- implement a set of European demonstrators of smart, shared mobility and/or logistics use cases in real traffic conditions with ambitious and realistic operational domains (balancing environmental complexity, risk, speed, economic viability, etc.) enabled by CCAM solutions (SAE Level 4) with market potential (i.e. with scalable business and operating models).

- Test robustness, reliability and safety of highly automated CCAM systems and services, while focussing on user interaction and interaction with other road users (specifically vulnerable road users such as pedestrians and cyclists). This includes testing of key enabling technologies (e.g. sensors, connectivity, cybersecurity, AI, big data, space-based services), physical/digital infrastructure support and optimised traffic and fleet management.

- **address user and customer needs for mobility and logistics, paying special attention to differences in mobility patterns by gender, age, disability and other social groups**. Further, deploy high quality services that are well integrated with other modes and existing mobility services.

- apply, test and demonstrate the common evaluation framework for large-scale demonstration pilots in Europe and the test data exchange framework, provide input to the European knowledge base on CCAM (see topic HORIZON-CL5-2021-D6-01-06) and contribute to the European database of relevant scenarios (see topic HORIZON-CL5-2021-D6-01-02).
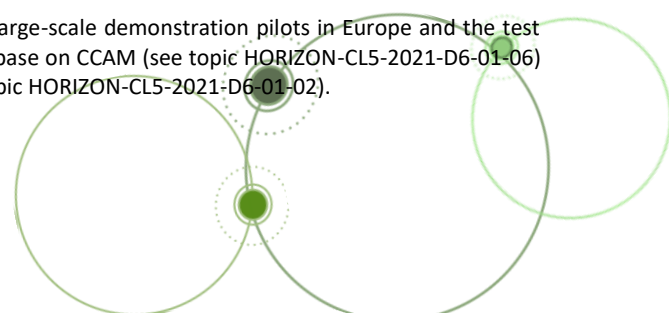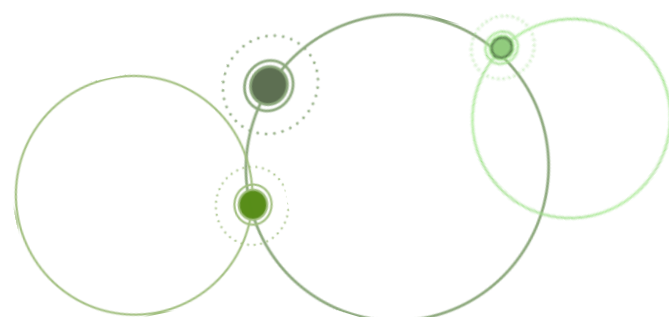
Call – Clean and competitive solutions for all transport modes

Proposed actions should contribute to effective assessment and demonstration of benefits on energy efficiency, traffic flow, safety, user appreciation, etc. based on holistic modelling solutions. If possible, already existing investments at national and European level on demonstration activities should be leveraged, optimising return on investments and create a strong basis for even larger scale demonstrations and system integration. Proposed actions should foster the collaboration between public and private stakeholders (e.g. cities, regions and infrastructure operators, authorities, civil society organisations, public transport operators, OEMs and suppliers, logistics hubs, freight transport and logistics service providers and freight transport and logistics users, research providers, ITS and telecom sector) to achieve common objectives and assess societal impacts. **Co-creation with users should be considered to demonstrate benefits and raise public acceptance/adoption of CCAM under real-world conditions. To this end, it is recommended to develop solutions that are grounded in social innovation.**

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions, as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Proposed actions are expected to focus on demonstrators for integrated shared automated mobility solutions for people, for goods or for both, and should address resulting synergies and complementarities in the CCAM ecosystem when possible. All vehicles used for testing the innovative CCAM concepts should use zero emission technologies. In order to achieve the expected outcomes, international cooperation is advised, in particular with projects or partners from the US, Japan, Canada, South Korea, Singapore, Australia. This topic implements the co-programmed European Partnership on 'Connected, Cooperative and Automated Mobility' (CCAM).

Type of action	Innovation Action
Deadline	**12 January 2022**
Expected EU contribution per project	Between EUR 20.00 and 25.00 million
Topic information	Link

Call – **Clean and competitive solutions for all transport modes**

HORIZON-CL5-2022-D6-01-02: Reliable occupant protection technologies and HMI solutions to ensure the safety of highly automated vehicles (CCAM Partnership)

Expected Outcome

Project results are expected to contribute to all of the following expected outcomes:

- Protection systems in Connected and Automated Vehicles (CAVs) designed for a greater variation of unconventional seating positions and body postures, including sex, age and ability differences, to be sufficiently inclusive to encompass the diversity of the occupant population, considering all situations and conditions for the application of such systems and taking into account different accident configurations with a higher market penetration of CAVs.

- New, advanced Human-Machine-Interface (HMI) solutions as enablers for the safe and efficient co-existence and interaction of CAVs with other road users (including Vulnerable Road Users and non-automated vehicles). Interfaces should be reliable and seamless, based on comprehensive knowledge and models of individual human behaviour and capabilities.

- Advanced driver/passenger condition monitoring and improved HMI functionalities to prepare the driver to take control as may be necessary when the vehicle reaches the limits of its Operational Design Domains (ODD).

- Consistent design methodologies and tools for performance assessment of the new protection systems.

- Delivering evidence-based support to the regulatory bodies for the potential adaptation of traffic rules.

Scope

In order to ensure the safety of highly automated vehicles, on-board systems need to anticipate risks reliably, prevent crashes and minimise the consequence of unavoidable collisions while enhancing user acceptance, and generating trust and reliance on automated systems through well-designed, informative Human-Machine-Interfaces. The proposed actions should address all the following aspects:

- Development of vehicle crashworthiness and advanced safety solutions in order to protect passengers and mitigate injury risk in unavoidable collisions also with new, unconventional seating positions and body postures, considering new protection principles and taking into account all situations and conditions for the application of such systems (for example in shared automated road vehicles). This also includes the identification of new accident configurations and adaptations to the structural layout of vehicles.

- **Development of empathic HMI solutions, which includes a framework for modelling human emotions, in order to enable natural and intuitive interaction of CAVs with the driver, passengers and with other road users (including unprotected ones) also in mixed traffic situations.**

- Monitoring approaches and simulation models to detect and assess occupant status (including health) and level and point of attention of the driver, enabling appropriate HMI, linked also to the new intelligent protection systems in order to fully leverage their potential in terms of adapting to different seating positions, body postures, occupant sizes etc., including gender, age, and ability differences.

- Improved solutions to address situations in which human drivers are expected to seamlessly resume control, for example when the limit of the ODD is approaching.

- Recommendations for user-centric HMI design guidelines and for an extension of the European Statement of Principles for human-machine interaction (ESoP) towards automated vehicles should be derived, taking into account also the interaction with unprotected road users and other non-automated, non-connected vehicles.

- Development of assessment tools for the developed protection technologies and advanced safety solutions in order to support the definition of safety requirements, standards (e.g. UNECE) and the analysis of potential needs for the adaptation of traffic rules.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions, as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. In order to achieve the expected outcomes, international cooperation is advised, in particular with projects or partners from the US, Japan, Canada, South Korea, Singapore, Australia. This topic implements the co-programmed European Partnership on 'Connected, Cooperative and Automated Mobility' (CCAM).

Type of action	Research and Innovation Action
Deadline	**12 January 2022**
Expected EU contribution per project	Between EUR 6.00 and 8.00 million
Topic information	Link
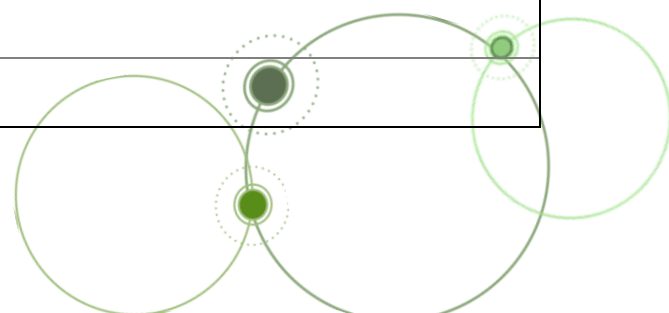
HORIZON-CL5-2022-D6-01-04: Integrate CCAM services in fleet and traffic management systems (CCAM Partnership)

Expected Outcome

Project results are expected to contribute to all of the following expected outcomes:

- Concepts of fleet and traffic management in the CCAM eco-system enabling optimised systems for the mobility of people and goods that take into account the balance between societal and individual user needs.

- Intermodal interfaces and interoperability between traffic management systems (of different geographical locations and/or of CCAM vehicles and other modes of transport) considering integration beyond road transport in the overall multimodal transport system providing seamless mobility services.

- Advanced simulation models and tools that enable and help assessing new traffic management strategies (including dedicated lanes, priorities at intersections etc.) for CCAM.

- Optimised mobility network load balancing approaches through advanced traffic management guidance and information loops that can reach individual users as well as operational traffic management actors.

- Effective cooperation and governance models for operating CCAM services as part of real-life fleet and traffic management systems developed and tested.

Scope

Proposed actions should develop and demonstrate concepts of traffic and fleet management to achieve a desirable integration of CCAM vehicles in the entire mobility system. CCAM vehicles should be considered in their different sizes and usages as well as their mobility service provision (private, public, shared, pooled etc.). Proposed actions should address both the transport of people and goods with automated fleets (commercial/logistics fleets, fleets operated by public or private transport operators) and individual vehicles (CCAM- or conventional vehicles) well integrated in the entire traffic management system. They have to address technology gaps to foster vehicle integration, communication and better manoeuvre coordination and orchestration concepts in managing fleets and traffic as well as integrating public transport and other shared mobility concepts. This involves planning, forecasting and managing fleet and individual vehicles' movements according to their specific needs.

Proposed actions should demonstrate traffic efficiency improvements by mobility network load balancing of routes, optimizing reliability of arrival times of goods delivery or shared mobility services, organize measures in case of events, or bilateral communication and acknowledgement of traffic management guidance if advised from an appropriate control centre. Proposed R&I actions are expected to address intermodal interfaces and interoperability between traffic management systems from one geographical location to another and from one user group to another to attain seamless mobility for all. Proposed actions should develop and demonstrate mixed traffic orchestration concepts, enabling or involving new mobility business cases for fleet operation (logistics, public or private transport operator, etc.). **These new fleet and traffic management approaches should closely link to societal and individual user needs (including VRUs and other connected or non-connected users).** Advanced simulation models and tools should be able to test and demonstrate in real life traffic their ability to support the optimisation and balancing of the mobility network load. Testing and demos in real life traffic conditions should be undertaken through engagement with stakeholders from the industry, public authorities, public and private operators, service providers, the research sector and road and vehicle users and by satisfactorily addressing the priorities of all (win-win-win). **Governance of the traffic management system has to take into account the different needs and requirements of the users, depending on their gender, socio-economic background, age, ethnicity or ability,** and the availability of services enabled by CCAM and the accordingly relevant supporting infrastructure. Both citizen-led needs and CCAM developments will guide the governance of traffic management systems which will eventually see the CCAM fleets of private and public transport (including on demand PT) integrated fully into the transport network. It is recommended to develop solutions that are grounded in social innovation.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions, as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities. In order to achieve the expected outcomes, international cooperation is advised, in particular with projects or partners from the US, Japan, Canada, South Korea, Singapore, Australia.

Type of action	Innovation Action
Deadline	**12 January 2022**
Expected EU contribution per project	Between EUR 4.00 and 5.00 million
Topic information	Link
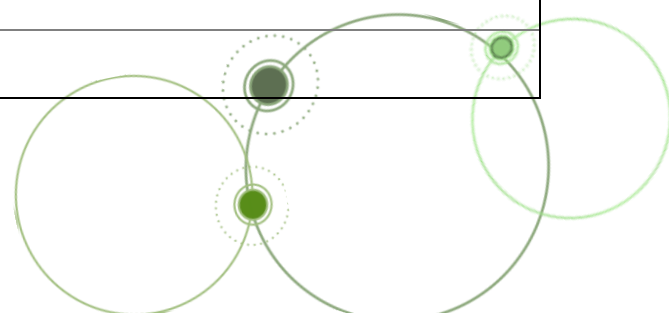
HORIZON-CL5-2022-D6-01-05: Artificial Intelligence (AI): Explainable and trustworthy concepts, techniques and models for CCAM (CCAM Partnership)

Expected Outcome

Project results are expected to contribute to all of the following expected outcomes:

- Concepts, techniques and models based on Artificial Intelligence (AI) used for situational awareness, prediction, decision making and triggering of actions for time critical and safety relevant CCAM applications as well as for cyber threat detection and mitigation.

- A clear understanding of the capabilities, limitations and potential conflicts of AI based systems for CCAM.

- Increased user acceptance from an early stage, based on explainable, trustworthy and human-centric AI. Interactions with vehicles using AI should be understandable, human-like and reflect human psychological capabilities, and free of gender, ethnic or other biases.

- Accelerated AI development and training for CCAM enabled by a relevant set of real and synthetic traffic events and scenarios.

- AI based CCAM solutions will evolve from reactive and/or adaptive system support into predictive system state awareness (including driver state and user diversity), decisionmaking and actuation, enhancing road safety especially in near-critical situation.

Scope

The deterministic understanding and consequential design of assistance systems are mostly reactive or to some extent adaptive. In the transition from driver assistance systems towards fully automated systems, a critical aspect is the decision making (i.e. planning and acting), based on robust and reliable detection and perception. AI has a huge potential to advance this process. Specifically, in more complex and dense traffic environments, highly automated driving functions will benefit from the system state prediction enabled by AI. Yet, the current state of technology using AI for CCAM has limitations regarding human-like actions, more specifically the intuitive, split-second (predictive) assessments and 'reflex decision making'. As such, any AI requires good integration into the overall system with close interaction and compatibility with the active safety systems (e.g. automated emergency braking). For the development process, training is essential for the performance of unbiased AI. It requires sufficient traffic and event data under varying conditions from all over Europe, avoiding limited data sets. The current, mainly deterministic approaches for validation in automotive development will not be sufficient for future training and validation of AI-based or AI-supported functions, which will also need to be able to deal with complex issues as (un)intended miscommunication.
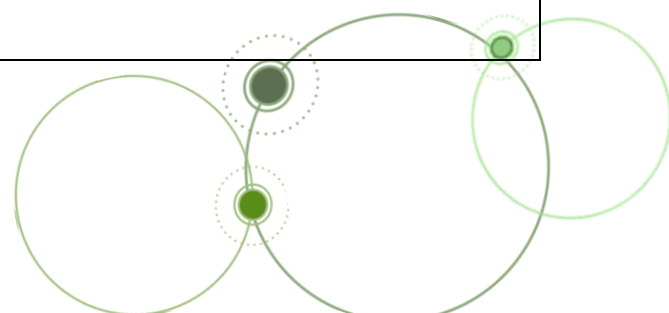
Proposed R&I actions therefore are expected to address all the following aspects:

- Support the development and integration of AI in CCAM with explainable, trustworthy and human-centric and unbiased concepts, techniques and models; this can be on vehicle level and on transport system level, where tactical and strategic links to traffic management and traffic conditions need to be established.

- Address the knowledge gap on AI training and validation approaches as well as efficient and ethical approaches for data handling of increasing amounts of data.

- Build upon existing and generated data for training and verification of AI supporting situational awareness in CCAM in more complex traffic scenarios (e.g. digital twins).

Specific automotive requirements on functional safety and security need to be considered in the development process of an automotive-grade AI ensuring consistency with existing validation procedures. **This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions, as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.**

In order to achieve the expected outcomes, international cooperation is advised, in particular with projects or partners from the US, Japan, Canada, South Korea, Singapore, Australia. This topic implements the co-programmed European Partnership on 'Connected, Cooperative and Automated Mobility' (CCAM).

Type of action	Research and Innovation Action
Deadline	**12 January 2022**
Expected EU contribution per project	Between EUR 5.00 and 6.00 million
Topic information	Link

HORIZON-CL5-2022-D6-01-06: Predictive safety assessment framework and safer urban environment for vulnerable road users

<u>Expected Outcome</u>
Project results are expected to contribute to the following expected outcomes:
<u>For Area A:</u>

- Harmonised, prospective assessment framework for road safety, both active and passive, solutions (for policy, regulatory and consumer assessment).

- Comprehensive virtual representation of challenging scenarios in future road traffic.

- Well-founded prognoses on the effects of new solutions on road safety and protection of vulnerable road users and vehicle occupants.

<u>For Area B:</u>

- 50% reduction in serious injuries and fatalities in road crashes by 2030, with a focus on measures addressing unprotected vulnerable road users

- Better prediction of all road users behaviour and the use of new transport modes

- Concepts and guidelines for safe inclusion of new types of vulnerable road users, e.g. those using new means of transport into the traffic system

- Development of solutions that facilitate inclusion of all vulnerable users in the transport system, including people with disabilities, the elderly, and children by providing a safe environment for walking and cycling.

- Facilitation of modal shift to active and clean modes of transport, improving the health of road users and the quality of urban environments.

<u>Scope</u>
A Safe System approach recognises that since accidents will continue to occur despite preventive efforts, it is a shared responsibility between stakeholders (road users, road managers, vehicle manufacturers, etc.) to take appropriate actions to ensure that road collisions do not lead to serious or fatal injuries. **The safe system approach requires a systematic, multi-disciplinary, multi-sectoral, and multi-stakeholder approach which addresses the safety needs of all users**; fatal and serious injury prevention, collision prevention and mitigation and post-collision care and aligns with other policies for co-benefits such as health, occupational health and safety, sustainable development and poverty reduction. In a Safe System approach, mobility is a function of safety rather than vice versa. It involves the implementation of system-wide measures that ensure, in the event of a collision, that the impact forces remain below the thresholds likely to produce either death or serious injury.

<u>Area A – Predictive safety assessment framework</u>
The road traffic system is changing with new technology, new means of transport as well as with regulatory and behavioural changes, and so will scenarios which are relevant for safety. Such future scenarios are not yet captured in accident databases. Traditional analysis methods and road studies can no longer predict the impact of new developments and new measures on road safety with an increased speed of technological development, but relatively slow penetration rates in the road traffic system. Also for already developed safety measures, scenarios need to be provided which cover more complex transport system levels where safety can be described in terms of risk and probability due to interplay between societal and technological driving forces as well as different stakeholder and user needs. A predictive safety assessment framework on higher system levels will support considerably the proactive management of road safety as an important principle of the safe system approach. Virtual simulation allows for fast and extensive evaluation of safety measures even in scenarios which do not exist in real traffic yet. With growing computer power, **safety assessment methods should therefore be extended to potential future scenarios and to the transport system level also allowing for the evaluation of socio-economic benefits. Such predictive assessment requires appropriate simulation environments and realistic models of all elements of the transport system (incl. human behaviour and traffic flow), which need to be harmonised to make them available for policy, regulatory and consumer assessment**. Within this context, **actions should address the following aspects:**

- **Develop new methods to efficiently predict the effects of the implementation of a new technology, new means of transport and regulatory or behavioural changes on road safety up to the level of socio-economic benefits.**

- Further develop virtual models of the relevant elements of the transport system for which such further development is most urgently needed, and validate them through testing activities and corresponding correlation.

- Analyse, based on selected examples, how the application of new technology and/or the introduction of new regulation will affect the remaining road safety burden, and how traffic and crash scenarios will change with their market penetration and/or enforcement respectively.

Area B – Safer urban environment for vulnerable road users

A safe system strategy and targets to reduce accidents in urban areas inevitably should have at its core the safety of vulnerable road users. Vulnerable road users (pedestrians, cyclists and powered two wheelers) constitute almost 70% of the fatalities from road crashes in urban areas. Our society is characterized by an ageing generation, which is still mobile and more active in road traffic than in the decades before, therefore it is of high importance to improve safety in road traffic for elderly people by seeking solutions that would concomitantly address infrastructure and road user behaviour. A safe system strategy needs also to take into account the interactions between different modes of transport, especially the road intersection with trams, light-rail, commuter rail, including infrastructure and human factors of vulnerable users in relation to level-crossings and trespassing. In this context, building on best practices (technological, non-technological and social), as well as ongoing projects and planned initiatives in the area of safe urban environment for vulnerable road users, **actions should address the following aspects:**

- **Protection principles and solutions to provide a safe environment for vulnerable road users through infrastructure measures and lifelong learning initiatives for vulnerable road users as well as for vehicle occupants (behavioural change, training courses, road safety education from an early age)**

- **Identify specific mobility needs and public space design needs to promote a safe journey for the vulnerable road users, and enhance their perception of safety (considering among others women's perception of safety and people with disabilities, like blind people in shared spaces).**

- Safe inclusion of new means of transport into the traffic system (including personal light electric vehicles, PLEVs, such as electric scooters and self-balancing vehicles and the safe transition to higher levels of automation e.g. automated public transport vehicles). Safety measures on the vulnerable road users' vehicles, improving stability, robustness and helping to prevent crashes overall.

- Protective equipment (helmets, clothes, reflectors) that is innovative, effective, user friendly and likely to lead to higher usage rates. Possibilities of active equipment able to detect oncoming collisions and warn the VRU in order to prevent crashes should be explored and demonstrated

- Improved detection mechanisms of vulnerable road users by other users and accurate prediction of their behaviour including at road intersections.

- Analysis of the most common causes of accidents concerning vulnerable road users and demonstration of applied solutions.

- Provide clear guidance to cities and Member States/Associated Countries on how to incorporate the vulnerable road users dimension into infrastructure planning and sustainable urban mobility plans especially for the aspects of safety, security and accessibility.

Actions should address the activities EITHER under area A) Predictive safety assessment framework OR under area B) Safer urban environment for vulnerable road users. Proposals should clearly indicate which area they are covering. At the same time, links will ideally be established between projects under both areas, so that solutions, concepts and measures developed under Area B) could be assessed using the framework from Area A). Typically, projects should have a duration of 36 to 48 months. Nonetheless, this does not preclude submission and selection of proposals requesting other durations. **Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.**

Type of action	Research and Innovation Action
Deadline	**12 January 2022**
Expected EU contribution per project	Between EUR 4.00 and 4.33 million
Topic information	Link
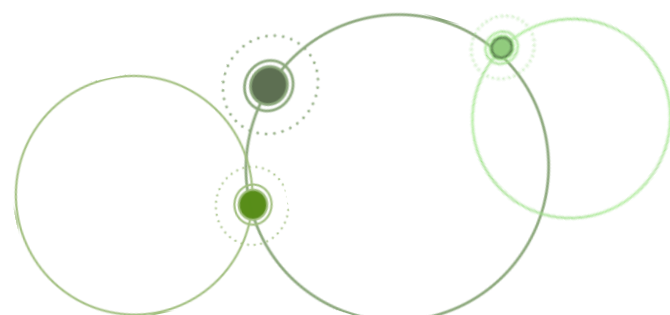
Call – Clean and competitive solutions for all transport modes

HORIZON-CL5-2022-D6-02-02: Urban logistics and planning: anticipating urban freight generation and demand including digitalisation of urban freight
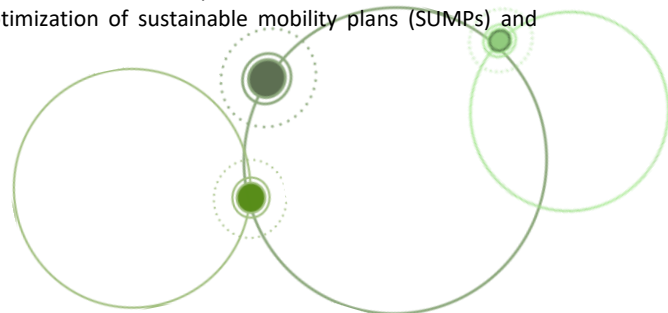
Expected Outcome

Project results are expected to contribute to all of the following outcomes:

- Take up and upscaling of innovative, best practice and replicable data driven logistics solutions and planning in the living labs involved in the proposals, while facilitating the common lesson drawing and learning at European level, in order to contribute to the priorities of the European Green Deal, which stresses that ''transport should become drastically less polluting, especially in cities. This action supports city sustainability targets such as climate neutrality, road safety, improved air quality, reduced congestion and better use of public space.

- Optimal mix distribution of land uses both in city centres and peripheries looking at the preferred rationales for achieving the best combination of residential, commercial, leisure and industrial space to reach the most sustainable mobility patterns according to the available and future transport supply and demand.

- Improved local authority capacity in the managing and collection of data, estimation and measurements of the impacts achieved by new measures and if a regulation is needed to ensure this happening.

- Valorisation of data and information gathered from urban freight to better understand the impact of long-haul deliveries and e-commerce on the city as "just in time" deliveries are producing longer and more trips with more and emptier vehicles, leading to more congestion, air and noise pollution, Greenhouse gas (GHG) emissions and road risk in urban areas.

- Optimise the potential mix of strategically positioned land, owned by public authorities (unused railway tracks and marshalling yards, real estate, parking) or by logistics service providers in urban areas, for developing a comprehensive policy strategy integrating transport, logistics and land use. The scope of this exercise includes the roll-out of new modes and increasing use of sustainable modes (waterways and rail). Better understand the impact of increasing transport and logistics patterns on the climate and environment, resilience and robustness of the transport network and the urban infrastructure. This exercise addresses as well the increasing impact of new modes, (electric assisted) cargo bicycles, light electric freight vehicles (LEFV) and vehicles on alternative fuels.

- Optimize shared transport facilities for goods through smart solutions.

- Improved space management and urban planning focusing on the "new normal" after the Covid-19 pandemic considering how cities are optimising their planning and allocation of space.

- Demonstrate and deploy economically viable and sustainable solutions driven by relevant technologies (e.g. real-time traffic information, space management, floating car data) and demonstrate the convenience of consolidation, consistent with the full planning of loading and unloading spaces, to deliver the services and the goods.

- New or upgraded sustainable urban logistics plan that includes the main stakeholders (cities, logistics operators, couriers, postal services, real estate and/or retail industries) and addresses to a minimum: development of safe and sustainable logistics and delivery models in cities, low emission zones, data collection and usage, consolidation and space management, clean and alternative vehicles, stakeholders dialogue, e-commerce.

Scope

How urban space is being used and allocated can influence congestion, noise, road risk, air quality, GHG emissions as well as liveability. At the same time there is a gap for purpose-oriented freight data collection in cities to support their decision making towards sustainability targets such as climate neutrality, air quality, road safety reducing congestion and better use of public space.

Proposals should consider dynamic space re-allocation for the integration of urban freight at local level and the impacts of how urban space is being used as well as the optimal mix of space distribution and of land uses. Proposals should analyse the potential of strategically positioned urban (or peri-urban) spaces to develop and implement a pilot demonstration, (but without interfering with parks, trees or other recreational green areas). The aim is to reduce the impact of freight transport and logistics on the urban fabric. Projects could consider involving real estate companies, logistics service providers, together with cities, to develop sustainable business models for open and clean hubs/consolidation spaces in cities (for example using/sharing existing private locations such as underground private parking, office buildings and other potential available spaces in cities – while respecting security constraints). A more efficient policymaking on urban freight logistics requires cities to enhance their data collection capabilities, while private logistics or e-commerce (like food delivery) companies and services should be encouraged to share data. Potential applications are Urban Vehicle Access Regulations (UVARs), including Low Emission Zones (LEZ), smart parking and dynamic space management and better traffic planning. A vast amount of transport data from different parts of the transport system currently remains unexploited. Understanding barriers and opportunities as well as developing local capacity related to data collection within the urban and peri-urban transport system is a first step to encourage private and public organisations to share transport data. Potential benefits of the data applications need to be checked on how they could support the optimization of sustainable mobility plans (SUMPs) and sustainable logistics plans (SULPs).

A thorough evaluation should provide qualitative and quantitative information on the results of the local solutions implemented. The effectiveness of the proposed measures in achieving local policy objectives should be evaluated and the possible barriers to their broad take up and deployment identified, together with recommendations on how to overcome them. This should be accompanied by mechanisms for common lesson drawing and learning, within the project, between the projects funded under this topic and through the CIVITAS Initiative. Proposals may include preparatory, take up and replication actions, research activities, as well as tools to support local planning and policy making. A demonstrated contribution to the implementation of the cities' Sustainable Urban Mobility Plans is expected. If not already in place, the city can develop a Sustainable Urban Logistics Plan or other appropriate planning instrument to manage urban freight and logistics. Funding for major infrastructure works is not eligible. Proposals should plan for an active collaboration within the CIVITAS initiative.

This topic requires the effective contribution of SSH disciplines and the involvement of SSH experts, institutions as well as the inclusion of relevant SSH expertise, in order to produce meaningful and significant effects enhancing the societal impact of the related research activities.

Type of action	Innovation Action
Deadline	**06 September 2022**
Expected EU contribution per project	Between EUR 7.00 and 8.00 million
Topic information	Link
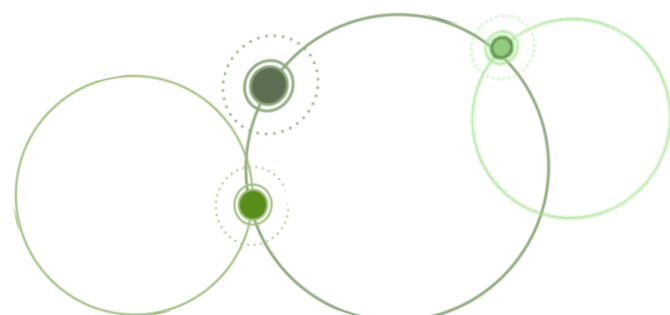
Cluster 6

Food, Bioeconomy, Natural Resources, Agricolture and Environment

HORIZON-CL6-2022-BIODIV-01-03: Network for nature: multi-stakeholder dialogue platform to promote nature-based solutions

Expected Outcome

This topic aims to support the development of policies, business models and market conditions to scale up and speed up the implementation of nature-based solutions (NBS). It will contribute to deploying NBS more widely and to fully reaping their economic, social and environmental benefits in order to build a competitive sustainability in Europe and to tackle climate change. NBS contribute to the EU biodiversity strategy for 2030 and other Green Deal priorities, by supporting biodiversity and vital ecosystem services: climate change mitigation and improving carbon sinks, biomass provision, access to fresh water, clean soil, healthy diets and lifestyles and sustainable food systems. Deploying NBS will also create green jobs and build resilience to climate change and natural disasters. Successful proposals must contribute to all following expected outcomes:

- Broad and effective community of innovators in the EU and associated countries, practitioners and developers of NBS – including but not limited to Horizon 2020/Horizon Europe projects – engaged across communities of science, business, policy and practice, and from local to global level;
- Better engagement, with public authorities, private sector and society at large for implementing and investing in NBS;
- Establish European NBS "quality brand" with an underlying, comprehensive and agreed vision and agenda, to position and promote EU excellence in NBS innovation;
- Improve cooperation and synergies with key strategic international partners and collaboration with CEN/CENELEC to develop European and international standards and foster the emergence of a global market for NBS;
- Consolidate NBS knowledge across sectors and disciplines through regional and Europe-wide transdisciplinary collaboration, advisory services, awareness raising, knowledge transfer and skills development.

Scope

Nature-based solutions (NBS) deliver multiple ecosystem services to address diverse societal challenges with a systemic and innovative approach. An effective multi-stakeholder platform is needed to support and consolidate the understanding of NBS and to promote their use and speed up market up-take and wider implementation. Such a platform enables: a) dialogue, interactions, knowledge and information sharing; b) integration of EU project results and platforms; and c) collaboration and think-and-do-tanks among relevant stakeholders (science, public administration, professional organizations, businesses and investors, civil society).

NetworkNature, a CSA funded under Horizon 2020's Societal Challenge 5 (WP 2019) that is due to end in 2022, is in the process of creating this platform. The Oppla portal is developing the underlying EU NBS knowledge repository, supporting access, sharing NBS knowledge more widely, including from EU-funded NBS projects, to already engaged and new target audiences, such as the finance and investment sector and the wider public. This topic aims to maintain and build upon the achievements of NetworkNature and Oppla.

The successful proposal should further develop and consolidate an engaged, broad and effective European community of innovators, practitioners and developers to promote the design, deployment, out- and up-scaling of NBS at the European and global scale, while recognising regional and national specificities, contexts and needs. The successful proposal should undertake continuous and strategically driven stakeholder dialogue and facilitate sharing of practice, experience and expertise related to all NBS-relevant aspects, across multiple scales and sectors. **Actions should cover social, economic, financial, environmental, educational, institutional, regulatory and cultural aspects; in particular:**

- **Improve engagement, strengthened ties and new partnerships with public authorities, the private and financing sector and society at large to implement and invest in NBS, based on a high level of awareness about their advantages in order to widen the uptake of these solutions;**
- Maintain and further develop an online open source stakeholder platform that facilitates the interactions within and between NBS knowledge holders and implementers;
- Identify, evaluate, standardise and gather tools, mechanisms and advisory services that support different actors in NBS in a one-stop-shop, aiming at supplying offers to match the needs which are brought forward;
- Build on NetworkNature's business plan, to make such a platform financially self-sustainable by the end of the project, and emphasise payback models and payable advisory services;
- Maintain and support established NBS hubs and establish new ones; support and advise on communication and outreach campaigns and regular events in all Member States, involving international networks and environmental communicators and targeting all relevant stakeholders involved in the NBS value chain, including the scientific community;
- Develop a ready-to-use communication toolbox in all EU official languages for regional and local authorities to better communicate about NBS and their benefits, namely in terms of economic growth and job creation;
- Facilitate the clustering of current and upcoming EU-funded NBS relevant research and innovation projects and promote the uptake of their results in further EU or national initiatives (e.g. in projects resulting from the LIFE programme or cohesion policy);
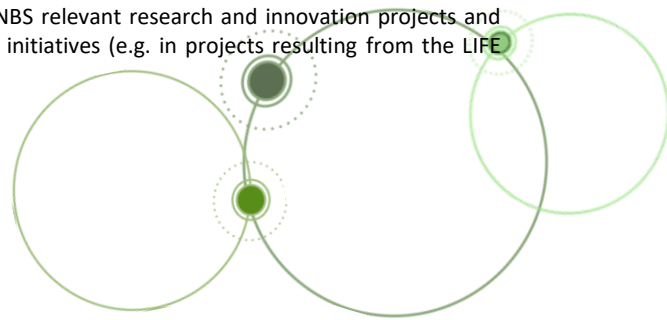
- Assist the Commission in organising science-policy workshops and assessing the contribution of NBS to global and EU policies, notably related to the EU Green Deal. These include biodiversity, pollution, climate adaptation and mitigation, water, agriculture and forestry, as well as urban and regional development, health, transformative change and just transitions;
- Facilitate the development of guidelines for practitioners with state-of-the-art NBS design practices and protocols; Collaborate with CEN/CENELEC to develop European standards, making sure these guidelines are accessible to all users;
- Help to the develop and mainstream NBS-related professional training and include it in primary, secondary and higher-education curricula;
- Develop mechanisms for capacity building and knowledge sharing across disciplines, the involving EU and MS/AC-wide professional organisations. Include partner organisations across EU Member States to ease dissemination of NBS knowledge at local and Europewide level;
- Promote international cooperation with key strategic partners and sharing best practice, in particular with – but not limited to –Latin American and Caribbean countries, the USA and Africa;
- Support a dialogue between cities implementing NBS (e.g. through twinning, peer exchanges, etc.) to encourage NBS knowledge sharing, experience exchange and access to best practices in the Member States; and establish links with other networking initiatives such as ICLEI, or the Covenant of Mayors;
- Further develop and maintain existing databases of facts and figures on NBS cost-effectiveness, including in monetised form, and according to NBS typology and challenges addressed by NBS, for improved communication and outreach;
- Identify specific areas and priorities where further research and innovation and educational development are needed to more widely implement, exploit benefits and market acceptance of NBS.

The proposals must address all of the above points and should ensure that all evidence and information will be accessible through the Oppla portal (the EU repository for NBS). Applicants should create links with projects under the same topic and other relevant ongoing or up-coming projects, notably the Horizon 2020 NBS project portfolio and its task forces; 'HORIZON-CL6-2021-BIODIV-01-05: The economics of nature-based solutions: cost-benefit analysis, market development and funding'; 'HORIZON-CL6-2021-BIODIV-01-06: Nature-based solutions, prevention and reduction of risks and the insurance sector'; 'HORIZON-CL6-2022-COMMUNITIES-01-05: Assessing the socio-politics of nature-based solutions for more inclusive and resilient communities'; 'HORIZON-CL6-2022- COMMUNITIES-02-02-two-stage: Developing nature-based therapy for health and well-being'; 'HORIZON-CL6-2021-COMMUNITIES-01-06: Inside and outside: educational innovation with nature-based solutions'. To this end, proposals should include specific tasks and sufficient resources for coordination measures, envisage joint activities and joint deliverables. Collaboration with the Biodiversity Partnership (HORIZON-CL6-2021-BIODIV-02-01) is expected in the context of strengthening the knowledge base for assessing, developing and deploying nature-based solutions. **This topic should involve the effective contribution of social sciences and humanities disciplines.**

Type of action	Coordination and Support Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 6.00 million
Topic information	Link
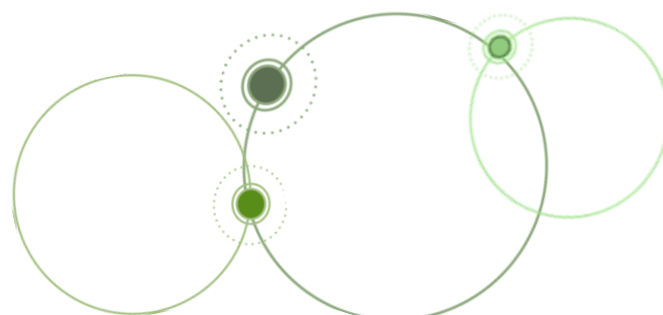
Call – Biodiversity and ecosystem services

HORIZON-CL6-2022-BIODIV-01-04: Natural capital accounting: Measuring the biodiversity footprint of products and organizations

Expected Outcome

In keeping with the EU biodiversity strategy for 2030 the successful proposal is expected to contribute to measuring and integrating the value of nature into public and business decision making at all levels for the protection and restoration of ecosystems and their services. Successful proposals will contribute to all the following expected outcomes:

- Change the way in which EU and associated countries organizations and companies allocate capital or influence their activities to promote a sustainable management by mainstreaming the use of corporate natural capital accounting.
- Integrate biodiversity and ecosystem considerations into business decision-making at different levels by measuring the biodiversity footprint of products and organisations through improving, developing and implementing standardised methods, criteria and standards that focus on essential features of biodiversity, ecosystems services, values, and sustainable use.
- Improve corporate biodiversity disclosure through innovative approaches to foster principles of biodiversity data transparency to accurately report on biodiversity, ecosystems and services.
- Demonstrate innovative solutions for valuing business impacts and dependencies in biodiversity and ecosystem and how this ends up in risks and opportunities for businesses private decision-making.
- Explore solutions to decrease the biodiversity footprint of retailers in global value chains.

Scope

The EU biodiversity strategy for 2030 recognises that biodiversity considerations need to be better integrated into public and business decision-making at all levels. This should include measuring the environmental footprint of products and organisations on the environment, through life-cycle approaches complemented and eventually integrated by natural capital accounting. In this context, the Commission will support the establishment of an international natural capital accounting initiative. Natural capital accounting has potential in providing a meaningful basis for business performance reporting by explicitly mapping out impacts and/or dependencies on natural resources and placing a monetary value on them. Specific examples include business accounting and reporting and the disclosure of non-financial reporting and accounting directives.

The successful proposal should develop, take up or demonstrate in real settings standardised natural capital accounting practices to support companies to measure, value and synthetise biodiversity and ecosystem risks assessment, notably in a way that is suitable for routine consideration in business and economy decision-making (including at executive level). It should also mainstream environmental footprints methods for instance through quantifying the environmental impacts of products, or supply and value chains, business models or organisations based the Commission Organisation Environmental Footprint (OEF) and the Product Environmental Footprint (PEF). The successful proposal should contribute to the alignment of natural capital accounting between the public and private sectors and to explore how the links to link the collection and use of statistics and data for natural capital accounting. It should also address the obstacles businesses are facing, in particular on data collection and improving the access and utility of European environmental data sets at different levels (i.e.: national statistical offices, environmental agencies, corporate reports) allowing better corporate and national data integration for economic and financial decision making. The successful proposal should work on methodologies for companies to set science-based biodiversity targets. **It should also address the specific decision-making needs of corporates and financial service provider to allow a specific and meaningful linkage with the macro-economic perspective** and the ecological concept of planetary boundaries at the scale of decision to be taken at corporate level enabling to assess and understand to corporate safe operating space.

The successful proposal should develop and test concrete natural capital accounting and reporting frameworks for business performance with respect to biodiversity and ecosystem services reporting. This should include explicit mapping of the impacts and/or dependencies on natural resources and placing a monetary value on them. **Specific examples should include business accounting, reporting, and the disclosure of non-financial reporting. The successful proposal should explore to which extent the System of Environmental-Economic Accounting / Experimental Ecosystem Accounting (SEEA EEA) framework in its current form is useful for natural capital assessment and natural capital accounting by businesses**. This should be done both in terms of methodological approach and data collection o the opportunities for adapting the SEEA EEA framework to make it more tailored to the business needs or the extent to which national statistical offices can benefit from data collection by businesses.

The successful proposal should develop and test concrete natural capital accounting basis for business performance on biodiversity and ecosystem services reporting by explicitly mapping out impacts and/or dependencies on natural resources and placing a monetary value on them. Specific examples should include business accounting, reporting, and the disclosure of non-financial reporting. The successful proposal should support the European contribution to a globally consistent approach to account for ecosystems and their value. The proposal should ensure that the EU continues to play a lead role in international environmental affairs through its support for effective measures, international standards and accounting relating to natural capital.

Call – Biodiversity and ecosystem services

The successful proposal should improve the access and utility of European environmental data sets at different levels (i.e: national statistical offices, environmental agencies, corporate reports) allowing better corporate and national data integration for economic and financial decision making. The successful proposal should support developing and testing natural capital and biodiversity based business models. These are expected to invest in nature for the benefit of biodiversity, ecosystems functioning and ecosystem services and address the challenge to turn the value of ecosystem into a revenue stream. The successful proposal should help making natural capital and biodiversity based business models bankable, thereby enabling private investments in nature conservation. In other words, 'how to facilitate making money with nature by enhancing ecosystem conditions but not by exploiting it to the detriment of nature'. The successful proposal should therefore take stock and establish links with the work undertaken by ongoing initiatives, European and national platforms on business and biodiversity, the Natural Capital Protocol, Value balancing alliance, the Knowledge Innovation Project KIP INCA and other Horizon 2020 related projects. The successful proposal should support the practical implementation of corporate reporting obligations such as under the EU Non-Financial Reporting Directive (2014/95/EU) or of the EU Taxonomy on Sustainable Finance. Applicants should create synergies with relevant projects under this call ('HORIZON-CL6- 2021-BIODIV-01-07: Ecosystems and their services for an evidence-based policy and decision-making'; 'HORIZON-CL6-2021-BIODIV-01-17: Policy mixes, governance (including financing) and decision-making tools for transformative action for biodiversity' the EU Biodiversity Partnership and the Science Service. To this end, proposals should include specific tasks and appropriate resources for coordination measures, and, where possible, envisage joint activities and joint deliverables. The proposal should set practical policy recommendations for the EU biodiversity strategy for 2030 targets and commitments. Proposals should contribute to strategic dialogue with the EC Knowledge Centre for Biodiversity forum and ensure that all evidence, results, data and information will be accessible and interoperable with the KCBD. In this topic, the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement. **This topic should include the effective contribution of social sciences and humanities disciplines.**

Type of action	Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 10.00 million
Topic information	Link
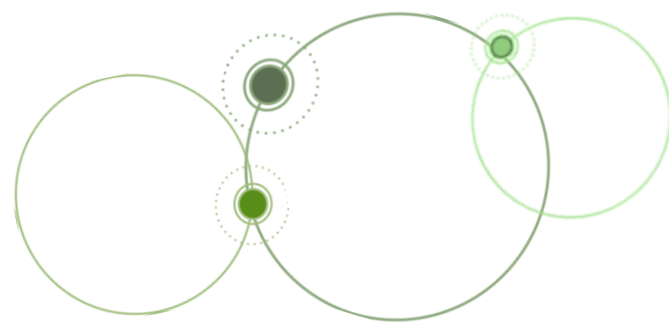
HORIZON-CL6-2022-BIODIV-01-05: Intercropping – understanding and using the benefits of complexity in farming and value chains

Expected Outcome

In line with the objectives of the farm to fork and biodiversity strategies, successful proposals will promote diversification in agriculture as a means to increase the resilience of the sector vis-a-vis variable environmental, climatic and economic conditions. By promoting biodiversity, proposals will address consumer demands for more diversified and sustainable production in agriculture.

Project results are expected to contribute to all of the following outcomes:
- **Integration of knowledge from diverse disciplines (e.g. ecology, agronomy, genetics, physiology as well as social sciences) to better understand, assess and use ecological processes which underpin the multiple benefits arising from intercropping**;
- Better understand the barriers for the adoption of intercropping by farmers;
- Optimised, field-tested and ready-to-use agronomic practices for intercropping applicable to various conditions across Europe;
- More wide-spread practical expertise of intercropping amongst advisors and farmers;
- Increased evidence and appreciation of the beneficial effects of intercropping on crop quality and product quality along with wider benefits for biodiversity, soil health, water quality and reduced GHG and air pollution emissions;
- Demonstration of the economic avenues and benefits of diversified production for the farming sector and related value chains.

In the long(er) term:
- More sustainable, biodiverse and resilient farming ensuring the continued delivery of a larger range of food and non-food products along with multiple ecosystems services;
- Stronger links between the various operators in value chains and increased economic avenues for the farming sector;
- Better appreciation by the wider public of the benefits of intercropping and diversification in general.

Scope

Farmers face increasing pressure to shift production towards lower input systems, while continuing to ensure sufficient supplies of food and non-food products. The Green Deal in particular has set ambitious targets to reduce by 2030 the overall use of chemical pesticides and fertilisers, reduce nutrient losses and increase organic farming. Species rich production systems such as intercropping have shown significant potential to increase resource efficiency and resilience against biotic and abiotic stresses, thereby allowing to deliver yield gains without increased inputs, or stabilise yields with decreased inputs. Diversified farming systems making use of strategic intercrops can also improve soil health and deliver multiple ecosystem services. The benefits of intercropping are the result of highly dynamic interactions between plants and their environment and allow to optimise the use of resources such as nutrients, water or solar radiation. Despite these benefits, intercropping is not widely applied in European agriculture, due e.g. to an increased complexity of operations and labour intensity at farm level or a market pulls for more standardised products and processing as well as for simplified modes of marketing.

Activities should:
- Study the (context specific) mechanisms that underpin the benefits associated with intercropping such as enhanced resource efficiency, disease and pest avoidance and product quality;
- Elucidate the links between above- and below-ground species interactions and how these could be optimised through management;
- Provide evidence on the effects of intercropping on product quality down the value chain;
- Identify, test and demonstrate agronomic practices that promote benefits from intercropping by optimising the interactions between plants, environment and management (G x G x E x M) , including the use of inputs and adapted machinery such as precision tools;
- Explore farmers' the motivation to adopt intercropping practices and propose solutions to overcome potential barriers;
- Promote the uptake of intercropping through the development of guidelines and wide-spread practical demonstrations taking into account a range of farming systems, pedo-climatic conditions and value chains;
- Identify and test avenues for marketing and processing of more diverse farming outputs across the value chain.

Result of activities should benefit both conventional and organic agriculture. International co-operation is strongly encouraged in particular with countries where intercropping is more widely applied, yet would benefit from further optimisation. Activities must implement the multi-actor approach, thus ensure an adequate involvement of advisors, farmers, other players in the value chain and consumers. Communication and outreach to a wide range of stakeholders is essential.

This topic should include the effective contribution of SSH disciplines.
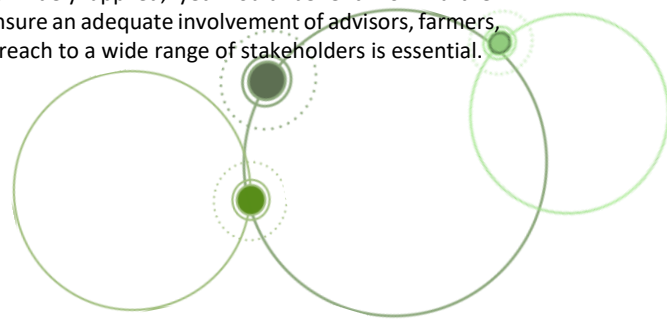
Call – Biodiversity and ecosystem services

Proposals should specify how they plan to collaborate with other proposals selected under this and other relevant topics, e.g. by undertaking joint activities, workshops or common communication and dissemination activities. Proposals should allocate the necessary resources to cover these activities.

Type of action	Research and Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 8.00 million
Topic information	Link

HORIZON-CL6-2022-BIODIV-01-08: Assessing the nexus of extraction, production, consumption, trade and behaviour patterns and of climate change action on biodiversity in the context of transformative change

Expected Outcome

In line with the EU biodiversity strategy, a successful proposal must develop knowledge and tools to understand the role of transformative change for biodiversity policy making, address the indirect drivers of biodiversity loss, and initiate, accelerate and upscale biodiversity-relevant transformative changes in our society.

Projects must address all of the following outcomes:

- **Economically, socially, ethically and institutionally viable and sustainable pathways are designed to minimise biodiversity loss or to enhance biodiversity.** These pathways should consider mutually influencing extraction, production, consumption, trade patterns in the medium- and long-term (beyond 2030).
- **Improve understanding of the human dimensions impacting biodiversity i.e. ethics, social context, institutions, organisation, behaviour will provide policy makers, industrial stakeholders and civil society the tools needed to reframe their actions, by highlighting the synergies of mainstreaming biodiversity with climate transitions, including on how to avoid or minimise trade-offs.**
- **Better understand social norms and behaviours, linked to socio-economic values (e.g. ethics, social context of individuals, consumers, institutions, organisations, industry) affecting biodiversity.**
- Inform and motivate transformational change through learning, co-creation and dialogue based on case studies. The understanding of the biodiversity inter-dependencies of the SDGs has improved; IPBES and IPCC are strengthened through European research and innovation. Provide a set of approaches, tools and knowledge influence policies at the appropriate level on transformative change for biodiversity – the key elements for this change are delivered by the portfolio of cooperating projects (of which these projects form part).

With focus on assessing the nexus of extraction, production (including processing), consumption, trade and behaviour patterns, including transformative changes for climate change on biodiversity for the EU and Associated Countries, international cooperation in particular with African countries, Brazil, Latin American and Caribbean countries or the Mediterranean region is strongly encouraged.

Scope

Proposals should address all the following points:

- Assess how extraction, production, processing, consumption, trade, behaviour patterns, especially linked to primary production (e.g. livestock with/or energy crops, etc. including through tele-coupling from consumption and all along supply chains), integrated food systems, and transformative changes towards climate neutrality, affect biodiversity and ecosystem services.
- Develop pathways together with key industries and key stakeholders to minimise loss of, and enhance biodiversity, whilst increasing the delivery of a wide range of ecosystem services. These industries cover food, feed, fibre, energy production and the wider food chain (related to bio-economy, renewable energies, infrastructure, technologies), and the deployment of climate mitigation and adaptation measures potentially harmful for biodiversity (e.g. concrete walls in coastal areas, replacement of biodiversity rich ecosystems for energy crops, etc.).
- Identify and address leverage points for transformational change in trade, triggering changes in established and new production and consumption patterns for new business models.
- Highlight the potential of (1) public procurement for delivering biodiversity benefits and (2) nature-based solutions for enabling and accelerating the relevant aspects of transformative change.
- **Quantify investments into infrastructure and labour that could be shifted from impacting biodiversity negatively towards benefits for biodiversity, including the anticipation, mitigation and management of social, institutional and economic conflicts this may trigger (or decrease), to achieve a just transition process.**
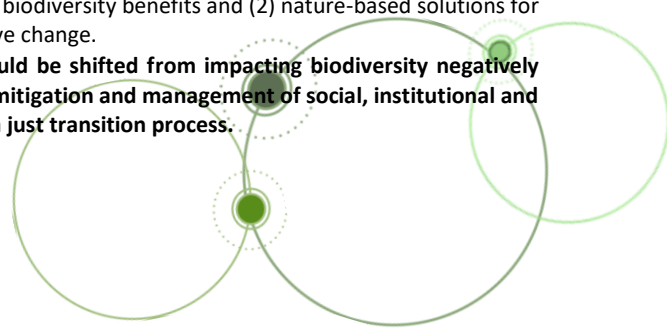
Call – Biodiversity and ecosystem services

- **Understand and engage communities and other social actors, including through citizens science, and initiate behavioural changes leading to production and consumption patterns preventing further biodiversity loss**.
- Cooperate with ongoing activities to include biodiversity into integrated assessment models and analyse the usability of existing and emerging concepts such as 'Planetary Boundaries', 'Doughnut Economy', 'Environmental Footprints'.
- Explain the relevance of transition pathways for biodiversity for competitive sustainability, towards a just transition in the full range of SDGs and climate neutrality.

Unsustainable production and consumption, including the role of trade for linking both, are pushing many of the direct drivers of biodiversity loss: land use change, overexploitation, climate change and pollution. Proposals should, based on a clear understanding of these relationships address how leverage points and levers can be identified and used for generating benefits for biodiversity, e.g. through revision of regulation, standards, funding practices or governance processes. They should highlight how the primary production sectors (in particular in agriculture, forestry, fisheries, raw material extraction, and also the construction sector) and the related infrastructure and energy provision and use impacts biodiversity directly.
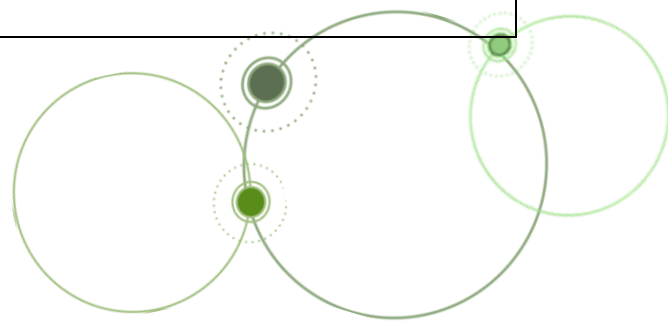
They should show effects on the direction of economic development, which leads to lock-in effects, inequalities, lack of capacities of institutions at every level to shift towards sustainable use, the protection and restoration of biodiversity and ecosystem services. On patterns of consumption, proposals should show how their impacts such as uneven use and exploitation of resources, generation of waste and pollution, value setting, power setting in societies, institutions and financial streams could be addressed in business, institutional and consumer agendas to achieve positive outcomes for biodiversity.

Proposals should assess the cultural diversity that influences these compromises and people's engagement, and lead the way to further mainstream biodiversity in socio-economic and environmental agendas, from the transformative aspect of changing extraction, production and processing, consumption, trade and behaviour patterns, including on actions for addressing climate change on biodiversity. They should also analyse and test the use of nature-based solutions as tool in this regard. Optimal and cost-effective use of behavioural games, networks of sensors, GIS-mapping, big data and observational programmes such as the European Earth observation programme Copernicus, through the Group on Earth Observations (GEO) and the Global Earth Observation System of Systems (GEOSS) as well as citizens' observatories, should be used as appropriate to enable the integration and visualisation of data. **Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.** Proposals should build their analysis upon the links between multiple Sustainable Development Goals, to deliver direct and indirect biodiversity benefits, and of the role of biodiversity in reaching the set of Sustainable Development Goals, when related to extraction, production, consumption, trade and behaviour patterns. Proposals should produce case studies and collect good and bad examples that could inform these transformations and inform and inspire transformative change through learning, co-creation and dialogue.

Proposals should include specific tasks and ensure sufficient resources to develop joint deliverables (e.g. activities, workshops, as well as joint communication and dissemination) with all projects on transformative change related to biodiversity. This concerns projects funded under this destination, or under calls included in Destination 'Fair, healthy and environmentally-friendly food systems from primary production to consumption' related to transformational change (Fair, healthy and environmentally-friendly food systems from primary production to consumption) that aim to deliver various co-benefits, including on the reduction of biodiversity loss. Projects should use existing platforms and information sharing mechanisms relevant for transformational change and on biodiversity knowledge. Cooperation and possibly synergies with relevant topics in Cluster 5 should be explored and established as relevant. Furthermore, cooperation is expected with the European partnership on biodiversity and with the Science Service. Proposals should show how their results might provide timely information for major sciencepolicy bodies such as the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Intergovernmental Panel on Climate Change (IPCC), as well as the Convention on Biological Diversity on project outcomes. Cooperation is requested with projects under 'HORIZON-CL6-2021-BIODIV-01-20: Support to processes triggered by IPBES and IPCC' and 'HORIZON-CL6-2022-BIODIV-01-10: Cooperation with the Convention on Biological Diversity'.

This topic should involve the effective contribution of social science and humanities disciplines.

Type of action	Research and Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 3.00 million
Topic information	Link

Call – Biodiversity and ecosystem services

HORIZON-CL6-2022-BIODIV-01-09: Understanding the role of behaviour, gender specifics, lifestyle, religious and cultural values, and addressing the role of enabling players (civil society, policy makers, financing and business leaders, retailers) in decision making

Expected Outcome

In line with the EU biodiversity strategy, a successful proposal will develop knowledge and tools to understand the role of transformative change for biodiversity policy making, finance and business leaders, address the indirect drivers of biodiversity loss, and initiate, accelerate and upscale biodiversity-relevant transformative changes in our society. The projects should address all of the following outcomes:

- Inform approaches tackling biodiversity loss and implementing nature-based solutions that consider how behaviour, lifestyles, religious, societal and cultural values shape the choices of producers and consumers, institutions and their policy decisions.
- **The motives behind broad societal changes and transitions are taken up in the design of relevant policies, communication and engagement campaigns and other actions**.
- **Leverage points in those sectors with the greatest impact on biodiversity are addressed, as the role of decisive actors (civil society, education institutions, policy makers, financing and business leaders, retailers) and their inter-sectorial consultation is known. This includes human rights and due diligence across economic value chains, as well as the role of employment patterns for a just transition.**
- The understanding of the biodiversity inter-dependencies of the SDGs has improved; IPBES and IPCC are strengthened by the contribution of European research and innovation. Approaches, tools and knowledge influence policies at the adequate level on transformative change for biodiversity – the key elements for this change are delivered by the portfolio of cooperating projects (of which these projects form part).

Scope

Proposals should engage with civil society organisations – in particular those working on gender, diversity, equity and inclusion –, social partners, policy makers, financing, industry and business leaders, and retailers and value-led (such as religious and cultural) institutions when addressing the role of enabling players for transformative changes in biodiversity actions, exemplified at relevant levels from local to global. They should identify and test measures to overcome barriers for behaviour changes in biodiversity action, considering ethical questions in behavioural economics, e.g. linked to future generations. This should acknowledge the interdependence of the climate and biodiversity crisis.

The proposals should explore intersectionality approaches and consider interlocking systems of power between gender and other social categories and identities such as religion, ethnicity and race (including migrants and refugees), social class and wealth, gender identity and sexual orientation and disability to better address access to and ownership of nature-based solutions. The proposals should analyse and address the impact of intrinsic vs economic/utilitarian values. They should include an estimation of the importance of engineered vs haphazard policy making factors at relevant levels, and specify and address effects of processes affecting adherence to democracy, voting campaigns, science denialism.

The proposals should build their analysis upon the synergies of multiple Sustainable Development Goals, to deliver direct and indirect biodiversity benefits, and of the role of biodiversity in reaching the set of Sustainable Development Goals, considering the importance of behaviour, lifestyle, religious and cultural values. The proposals should produce case studies and collect good and failed examples that could inform these transformations and inform and inspire transformative change through learning, co-creation and dialogue. Proposals should include specific tasks and provide sufficient resources to develop joint deliverables (e.g. activities, workshops, as well as joint communication and dissemination) with all projects with all projects on transformative change related to biodiversity funded under this destination, and should use existing platforms and information sharing mechanisms relevant for transformational change and on biodiversity knowledge. Furthermore, cooperation is expected with the European partnership on biodiversity and the Science Service (HORIZON-CL6-2021-BIODIV-01-19: A mechanism for science to inform implementation, monitoring, review and ratcheting up of the new EU biodiversity strategy for 2030 ('Science Service'). Proposals should show how their results might provide timely information for major science-policy bodies such as the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Intergovernmental Panel on Climate Change (IPCC), as well as the Convention on Biological Diversity on project outcomes. Cooperation is expected with projects 'HORIZON-CL6-2021-BIODIV-01-20: Support to processes triggered by IPBES and IPCC' and 'HORIZON-CL6-2021-BIODIV-2022-01-10: Cooperation with the Convention on Biological Diversity'.

This topic should involve the effective contribution of social science and humanities disciplines.
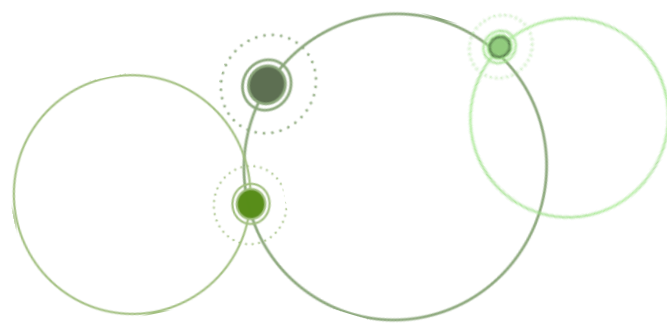
Type of action	Research and Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	Between EUR 3.00 and 4.00 million
Topic information	Link

HORIZON-CL6-2022-BIODIV-02-01-two-stage: Maintaining and restoring pollinators and pollination services in European agricultural landscapes

Expected Outcome

Responding to the EU Green Deal, the EU biodiversity strategy for 2030 and the farm to fork Strategy, a successful proposal will restore pollinator-habitats, support the development of pollinator-friendly policies, business models and market conditions, by helping to establish sustainable, productive, climate-neutral and resilient farming systems by minimising pressure on ecosystems, delivering a wide range of ecosystem services, improving public health and generating fair economic returns for farmers. Projects should address all of the following outcomes:

- Agricultural landscapes that are dominated by intensively managed crops and grasslands, are restored through co-designed (with farmers and other land managers, local communities, agricultural advisory services, landscape planners, the nature conservation sector etc.) large-scale, experimental pollinator-friendly practices and services and through social innovation processes, such as new innovative approaches to enhance community participatory planning and innovative business models.
- Management, restoration, conservation and connectivity of wild pollinator habitats follow scientific and policy recommendations, which have been tested in the projects on their applicability. The range of recommendations in question is set in the Assessment Report on Pollinators, Pollination and Food Production of IPBES and the updated Plan of Action of the international initiative on the conservation and sustainable use of pollinators.
- Systemic approaches provide an effective enabling environment for stakeholder actions. They demonstrate that coherent and comprehensive policies for the conservation and sustainable use of pollinators at various governance levels can be demonstrated at least at landscape scale, and contributing to foster sustainable agricultural practices while ensuring farming viability and profitability, for different agricultural sectors.
- Improved coordination in governance, as well as enhanced data accessibility, financing and maintenance agreements for actions beneficial for pollinators are achieved
- Adaptive management of measures for the conservation and sustainable use of pollinators is informed by continuous monitoring and assessing of the outcomes, including by using results-based payment schemes.

Scope

This topic aims at maintaining and restoring species-rich pollinator communities and their services in agricultural landscapes dominated by intensive land use, and facilitating the uptake of pollinator-friendly practices at wider scale. The direct and indirect drivers of pollinator decline are cross-cutting in nature. This calls for the need to ensure policy coherence and to integrate pollinator and pollination considerations not only in policy measures that support the transition towards more sustainable agricultural practices, but also across sectors (for example forestry, consumption and health) and at different spatial scales (farm, landscape, ecosystem). Despite efforts, many of the main direct drivers of pollinator loss have remained largely unchanged over the years: habitat fragmentation and land use change, the widespread use of synthetic chemicals in agriculture and in other sectors, invasive alien species, and pathogens (in case of managed pollinators). In particular, great attention has been focused on drivers linked to intensive agricultural practices, such as monoculture, and the use of synthetic fertilisers and pesticides that can have direct and indirect effects on pollinators. In addition, the increasing negative impact on pollinator habitats of other direct drivers, such as climate change, have exacerbated the problem.

This topic aims at restoring and maintaining species-rich pollinator communities and their services in agricultural landscapes characterised by intensive farming practices, and facilitating the uptake of pollinator-friendly practices in the agricultural sector at a wide scale, in different pedo-climatic conditions across Europe. The proposed projects should emphasise mainstreaming pollination concerns into policies, developing and implementing measures on the ground to support the conservation and sustainable use of pollinators, addressing risks, and building capacity. In doing this, they should involve all relevant stakeholders along the agri-food chain and share knowledge on multiple levels to integrate pollination considerations into farming, land use and other management decisions, focusing collaborative research on emerging issues and prevailing needs. The proposed projects should build on existing experience in particular on lessons learned and best practices gained through EU-funded projects and initiatives such as those supported by Horizon 2020, Results-Based Payment Scheme projects, the LIFE programme, and prepare the uptake of approaches developed and tested in this topic into future EU-funded activities (such as LIFE, the common agricultural policy, Horizon Europe). The proposals should show how their
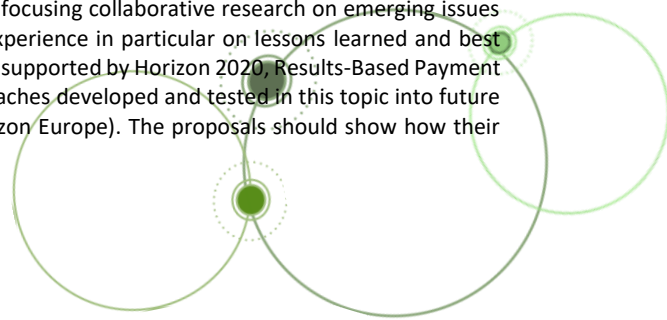
results may contribute to the EU Pollinators Initiative, feed into relevant IPBES functions, and ensure cooperation with the Convention on Biological Diversity. Coordination with the two following topics should be envisaged: 'HORIZON-CL6- 2022-BIODIV-01-10: Cooperation with the Convention on Biological Diversity' and 'HORIZON-CL6-2021-BIODIV-01-20: Support to processes triggered by IPBES and IPCC'. Projects are expected to secure additional funding or in-kind contributions when implementing restoration actions.

Proposals should include specific tasks and envisage sufficient resources to develop joint deliverables (e.g. activities, workshops, as well as joint communication and dissemination) with all projects funded under this topic for aspects of horizontal nature and for cooperation with other projects such as BiodivERsA, Oppla, the EC Knowledge Centre for Biodiversity, relevant H2020 projects such as SHOWCASE and HORIZON-CL6-2021-CLIMATE-01-08: 'Agroforestry to meet climate, biodiversity and farming sustainability goals'. Actions should use existing platforms and information sharing mechanisms relevant for pollinators and the restoration of their habitats. Furthermore, cooperation is expected with the European partnership on biodiversity138 and with the Science Service (HORIZON-CL6-2021-BIODIV-01-19: A mechanism for science to inform implementation, monitoring, review and ratcheting up the new EU biodiversity strategy ('Science Service'), and with other large-scale initiatives under Horizon Europe, such as the candidate partnership on agroecology, living labs, research infrastructures and the proposed mission 'Caring for soils is caring for life'.

The proposals should address all of the following points:
- Demonstrate measures to diversify large-scale farming systems and the resulting feeding resources and habitats of pollinators in agricultural lands, grasslands and semi-natural areas, through agro-ecological practices, including organic farming and agroforestry, as well as through home gardens, and forestry systems where relevant to the restored landscapes, with a view to ensure heterogeneous habitats formed by native species that offer diversified floral and nesting resources for pollinators;
- Create set-asides for nature, such as uncultivated patches of vegetation, to enhance floral diversity, and to ensure native, diverse, abundant and continuous floral resources for pollinator across time and space;

The two points mentioned above combined should cover at least 50% of the proposed budget.
- Analyse and evaluate different options to protect and conserve threatened pollinator species as well as their natural environment, and elaborate the requirements to promote recognition of pollinator-friendly practices and consequences on pollination functions and services in existing certification schemes; and develop methods for the inclusion of pollinator conservation into ecosystem restoration frameworks (in particular on grassland and other agro-ecosystems).
- Develop prototypes of potential extension services, farmer-to-farmer sharing approaches and farmer field schools to strengthen synergies between scientific evidence, traditional knowledge, conservation and farmer-researcher community practices, to exchange knowledge and provide hands-on education and empowerment of local farming communities on pollinators. This could include for instance fostering networks for exchanges of native seeds
- Elaborate, based on the large-scale approach, how the promotion of coherent policies across sectors and issues (e.g. biodiversity, agriculture and food security, chemicals and pollution, reduction of inequality, climate change and disaster risk reduction) could look like for pollinators. This scalability plan should be developed with the involvement of the communities concerned, and should include the dissemination of innovative solutions and practices, and a process for commitments in adopting large-scale restoration of pollinator communities within governance and financing systems, to allow replication and upscaling across the EU, associated countries and internationally. It should seek guarantees for the non-reversibility and/or continuity of restoration activities and/or further replication and/or expansion, implementation of sustainable management practices and monitoring after the end of the projects.
- **Assess and propose options to develop and implement innovative incentives, consistent with international obligations, for farmers and other actors along the agri-food chain, to encourage the adoption of pollinator-friendly practices** (e.g. carbon sequestration measures that increase pollinator habitats; conservation of uncultivated areas for pollinator forage; communication to consumers and other actors on the benefits of pollinator-friendly practices, etc). **This should also cover assessing the impacts on farmers' income, on overall business performance of farms, as well as on social aspects in farming communities.**
- Build on existing knowledge, developed inter alia by EU-funded research projects, to assess options to remove or reduce incentives that are harmful to pollinators and their habitats (e.g. pesticides subsidies; incentives for pesticide use as credit requirements from banks), and to promote alternative approaches to pesticide use (e.g. Integrated Pest Management), taking into consideration the needs of farmers, gardeners, land managers, indigenous people, local communities and other stakeholders;
- Design and test a system to monitor the effectiveness of the large-scale interventions, taking into consideration the scale-dependent aspects of protecting pollinators and managing pollination functions and services, using standard methods in line with the proposal for an EU Pollinator Monitoring Scheme, and contribute to their improvement.

The proposals should develop scientifically robust and transparent methodologies, building on achievements from previous research activities. To ensure trustworthiness, swift and wide adoption by user communities, and to support EU and national (including from associated countries) policy-makers, actions should adopt high standards of transparency and openness, going beyond documentation of results and extending to aspects such as assumptions, models and data quality during the
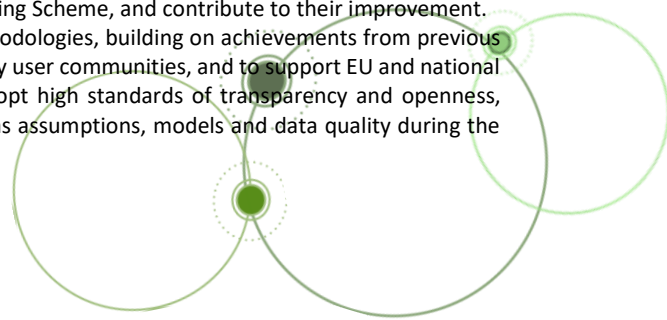
projects life. Applicants are reminded that costs for land purchase or lease are not eligible costs in the context of activities of research and innovation or innovation projects.

Type of action	Innovation Action
Deadline	1st stage - **15 February 2022** 2nd stage - **01 September 2022**
Expected EU contribution per project	Between EUR 6.00 and 10.00 million
Topic information	Link

Topics with minor SSH relevance

| HORIZON-CL6-2022-BIODIV-01-02: Building taxonomic research capacity near biodiversity hotspots and for protected areas by networking natural history museums and other taxonomic facilities |
|---|
| Link |

HORIZON-CL6-2022-BIODIV-01-06: Monitoring and effective measures for Agrobiodiversity
Link

HORIZON-CL6-2022-BIODIV-01-10: Cooperation with the Convention on Biological Diversity
Link
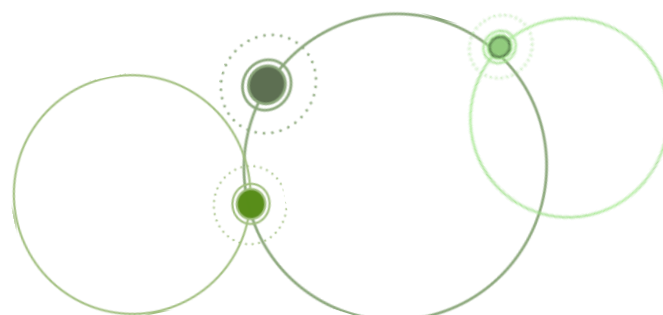
Call – **Fair, healthy and environmentally-friendly food systems**

HORIZON-CL6-2022-FARM2FORK-01-02: Socio-economics of pesticide use in agriculture

Expected Outcome

In line with the farm to fork strategy, the successful proposal will support integrated pest management practices facilitating the progress towards the ambitious target of reduced use of plant protection products while supporting the agricultural / forestry sectors to remain productive and contribute to sustainable and biodiversity friendly agriculture and/or forest health.

Project results are expected to contribute to all of the following expected outcomes:

- Identify opportunities and barriers to increase the uptake of integrated pest management and low-pesticide-input pest management across the diversity of EU and Associated Countries farming systems;
- Increase the capacity to understand the impact of current pesticide use practices and proposed alternatives on the agricultural sector;
- Develop a thorough understanding of farmers' decision-making, governance aspects and consumption patterns behind integrated pest management and low pesticide use practices;
- Support the design of relevant related policies to achieve the targets of the farm to fork and biodiversity strategies;
- Strengthened transdisciplinary research and integrated scientific support for relevant EU policies and priorities (Sustainable Use Directive, common agricultural policy (CAP), Green Deal objectives, European pillar of social rights, etc.).

Scope

Research has shown that well-designed integrated pest management programmes can control pests in an ecologically friendly manner; however, farming today relies on chemical treatments to ensure farm profits and yield. A better understanding of the social, economic and policy factors that can hinder or promote the uptake as well as evidence of the economic performance of integrated pest management/ low pesticide practices are needed to identify measures that can enhance its adoption and encourage the involvement of all relevant actors across the value chain. Project funded under this topic should ensure synergies and collaboration with other relevant ongoing Horizon 2020 projects.

Proposals should:

- Improve understanding of the reasons for the limited uptake of reduced pesticide use/integrated pest management practices and/or shift towards low-risk pesticides and bio-control agents and practices. This should include a deeper analysis of the evolution since the whole agricultural sector may be impacted by a reduction of pesticide use.
- Improve understanding of the impact (including direct and indirect effects) of current pesticide use practices and proposed alternatives at various scales, from fields to landscape and rural areas.
- **Analyse the sociological and economic drivers and unintended consequences, such as the switching of crops and/or pesticides when a plant protection product becomes unavailable**.
- **Analyse the consequences of the ongoing development of resistances to the use of pesticides (both in qualitative and quantitative terms), on productivity, on the economic performance of farms**, on natural habitats and biodiversity and the environment.
- Analyse the competitiveness of goods produced using chemical pesticide-free/low-pesticide agriculture.

Proposals should cover a wide range of farm typologies, sectors and systems representative of the diversity of farming in the EU and Associated Countries, including both conventional and organic. **Proposals must implement the "multi-actor approach" including a range of actors to ensure that knowledge and needs from various sectors such as research, social partners, plant health services and farmers/foresters are brought together.** The possible participation of the JRC in the project will consist of the use of a farm-level modelling tool to contribute to the assessment of the socio-economic impacts of alternative pesticide use practices, as well as to the evaluation of different policy scenarios to incentivise the uptake of alternative pesticide strategies. Additionally, the JRC could contribute to the analysis of possible survey data dealing with socio-economic impacts of current and alternative pesticide use practices. **This topic should involve the effective contribution of SSH disciplines.**

Type of action	Research and Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per projec	EUR 6.00 million
Topic information	Link
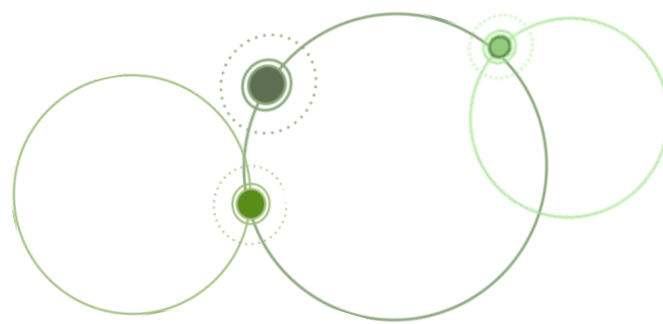
Call – **Fair, healthy and environmentally-friendly food systems**

HORIZON-CL6-2022-FARM2FORK-01-04: Innovative solutions to prevent adulteration of food bearing quality labels: focus on organic food and geographical indications

Expected Outcome

The farm to fork strategy aims to accelerate the transition to sustainable farming and food systems by, inter alia, promoting the growth of organic farming with a view to achieve the target of at least 25% of the EU's agricultural land under organic farming by 2030. Moreover, the strategy envisages the strengthening of geographical indications (GIs), by including specific sustainability criteria, where appropriate. One of the strategy's main priorities is to combat food fraud along the food supply chain. The successful proposals should therefore contribute to preventing food fraud of products with quality labels, in particular organic and GIs. In this way, they should facilitate progress towards the strategy's challenging target for organic farming and strengthen the GIs scheme.

Projects results are expected to contribute to all of the following expected outcomes:

- a wider use of new and improved tools and field-deployable methods and approaches for rapid and cost-effective verification of claims related to food products of plant and animal origin with quality labels, in particular organic and GIs;
- unlocked potential of new technologies and other innovative approaches (e.g., business models) fit for farmers and food businesses (especially small-scale farmers and small and medium-sized enterprise (SMEs)) as well as policymakers, which cost-effectively enable traceability and transparency along the supply chains of quality labelled food, in particular those with organic and GIs labels;
- improved functioning and effectiveness of the control systems in Member States and Associated Counties and the EU's legislative framework for organic and GI food products;
- increased data availability, interoperability and use, and improved analytical capacity for enhanced traceability and transparency along the supply chains of quality labelled food, in particular organic and GIs;
- well-informed decision-making by farmers, food businesses and policymakers to improve climate, environmental, economic and social sustainability along the supply chains of quality labelled food, in particular organic and GIs.

Scope

Quality labelled food products, such as organic and GIs, are generally more expensive than their counterparts. Therefore, foods with such quality labels are particularly prone to fraud. Illegal practices can considerably harm the quality schemes, as they can undermine consumer confidence, thus damaging the farmers and food businesses who respect the rules. The main challenge is that it is difficult for consumers and operators across supply chains to visually distinguish genuine from false organic or GI products. Traditional methods of determining food quality are time consuming and usually require special laboratory analyses, which are often costly and may not be sufficient to guarantee a product's authenticity and traceability. In addition, as organic and GI food supply chains become more complex, the need to ensure product traceability and transparency along the entire chain increases. Existing traceability and control systems help track products throughout the food supply chain and improve transparency. However, the organic and GI sectors rapidly change due to, for example, widespread use of e-commerce, and given the expected growth of these sectors, the risk of fraud may increase. Therefore, it is important to continuously innovate and upgrade the approaches to prevent fraudulent practices. Diverse new technologies and other innovative solutions (e.g., business models; participatory certification; local, short or mid-tier supply chains; etc.), are emerging to improve the authentication and traceability of quality labelled food products, in particular those with organic and GI labels, as well as to increase transparency of supply chains, thereby contributing to combating fraud. These innovative solutions need to be developed/improved, tested, demonstrated and deployed.

Proposals should investigate the current fraud practices affecting quality labelled food products, in particular organic and GI, and analyse the root causes/drivers of these practices and obstacles and ways to eradicate them. Based on these insights and building on the state-of-the-art in research and innovation, proposals should develop/improve, test, demonstrate and pilot promising innovative low-cost methods, tools and approaches to authenticate and/or trace quality labelled food products, especially organic and GIs, as well as to improve transparency of their supply chains from farm to fork. They should explore the potential of various technological and non-technological innovative solutions (e.g., digital (such as photonics, artificial intelligence (AI), blockchain, internet of things (IoT), machine learning, etc.), new business models (in particular involving and suitable for small-scale farmers and SMEs), suitable reference materials, rapid and field-deployable, non-destructive testing methods, technologies to improve cybersecurity, etc.), and their combinations. The heterogeneity of products and sectors, as well as the diversity of supply chains and contexts should be taken into account. Proposals should also investigate the barriers and incentives to scaling up the use of the innovative solutions as well as assess the positive and negative impacts on the different operations and actors in the organic and GI food value chains, particular attention should be paid to small-scale farmers, SMEs and consumers, as well as the control systems used in Member States and Associated Countries. Proposals should also develop a system to increase availability of and access to relevant data, promote data harmonisation and improve the ways in which data are stored. In addition, they should explore ways to advance the analysis, use, interoperability and security of data to enhance fair transparency and support better decision-making, to improve sustainability along organic and GI food supply chains. The innovative solutions should be widely
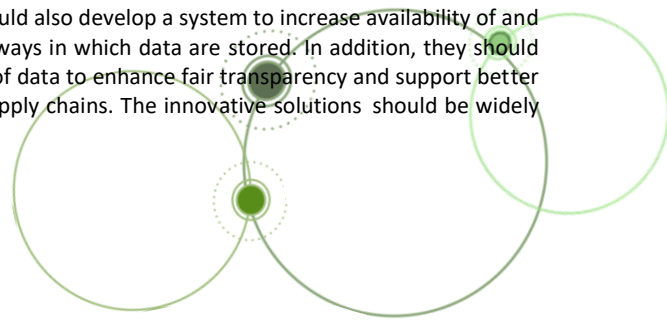
disseminated and recommendations for relevant actors in the public sector and business should be provided. Close involvement and consultation with project advisory board members is recommended. Projects should use the 'multi-actor approach', ensuring adequate involvement of all relevant actors, including input suppliers, farmers and SMEs. Proposals may build on existing research infrastructures, where relevant. Proposals are encouraged to build on past and ongoing EU-funded research and innovation projects, and are strongly encouraged to cluster with upcoming projects under the HORIZON-CL6-2021-FARM2FORK-01-10, HORIZON-CL6-2022-FARM2FORK-01-11 and HORIZON-CL6-2021-FARM2FORK-01-17 topics. They are also encouraged to cooperate with actors working on related initiatives, including the European Commission's Joint Research Centre (JRC) Knowledge Centre for Food Fraud and Quality, which provides expertise in food science, authenticity and quality of food supplied in the EU. The possible participation/contribution of the JRC in the project would consist of ensuring that the project deliverables are compatible with and/or improve existing databases and tools used at the European Commission and fostering open access to project results via dissemination through the European Commission Knowledge Centre for Food Fraud and Quality.

This topic should involve the effective contribution of SSH disciplines. For this topic, the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

Type of action	Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 4.00 million
Topic information	Link
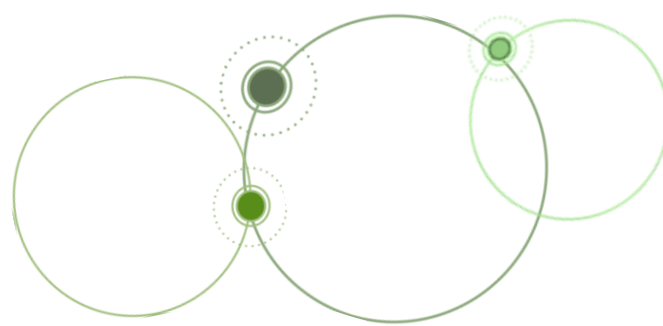
Call – **Fair, healthy and environmentally-friendly food systems**

HORIZON-CL6-2022-FARM2FORK-01-07: Building alternative protein-friendly sustainable and healthy food environments

Expected Outcome

In line with the European Green Deal priorities, the farm to fork strategy for a fair, healthy and environmentally friendly food system, and the EU's climate ambition for 2030 and 2050, the successful proposal will support R&I to promote the production, provision and consumption of alternative sources of proteins as well as dietary shifts towards sustainable healthy nutrition. This will contribute to transforming food systems so that they can deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, dietary shifts, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses. The EU's farm to fork strategy states that: "European diets are not in line with national dietary recommendations, and the 'food environment' does not ensure that the healthy option is always the easiest one". The food environment, which makes the link between food supply and diets, is one of the determinants of consumer choices and food production. As such, food environments are essential to enabling a dietary shift towards less livestock-based and less highly processed food (e.g., more fresh and minimally processed fruit and vegetables, plant-based and aquatic food to tackle the over-consumption of meat and dairy). Much more R&I is needed on food environments to ensure that environmental sustainability and health objectives can be achieved.

Projects results are expected to contribute to all of the following expected outcomes:

- Improving the effectiveness and efficiency of food environments to ensure that people, including the most vulnerable groups, have choices in terms of alternative proteins (e.g. plant-based, microbe-based, ocean-based (i.e. fish, algae, invertebrates), fungus-based, insect-based), to foster a dietary shift (accessibility and availability).
- Ensuring an overall improvement in public health as a result of this shift, with a shift towards healthy, sustainable and diversified dietary patterns in line with national dietary advice.
- Reducing the environmental burden of European diets, including but not limited to greenhouse gas (GHG) emissions, air pollution and impact on ecosystems, improving circularity (e.g. food waste and by-products), providing new, sustainable and healthy products made of alternative sources of proteins to consumers.

Scope

According to studies carried out by Milford et al. (2019) and Castellani et al. (2017), consumer choices depend on the food environment that ensures the availability of and access to food. The behavioural sciences suggest that, to achieve a meaningful dietary shift, a choice architecture should be designed to promote healthy and sustainable food preferences. Proposals are expected to address the following:

- Empowering the 'middle part' of the food system, including for example industry, processors, retailers, food services, cooks and caterers to shape the food environment toward sustainability EU-wide, through the provision of a diverse diet based on alternative protein sources, including through training/skills-building among different actors in order to produce and provide alternative protein food.
- Working on diversifying the offering, particularly in terms of alternative protein sources, and ensuring easier access to and affordability of sustainable and healthy (as defined in national dietary recommendations) foods and diets everywhere (urban, peri-urban and rural areas) for everybody (including the most vulnerable).
- Developing industry-ready processes to sustainably produce food based on alternative proteins whose sensory characteristics (e.g. colour, taste, structure) and nutritional value will be accepted by consumers.
- Developing a typology of food environments across Europe and identifying the enabling factors for positive transformative change to healthy sustainable diets.
- **Assessing the tools and instruments (e.g. policy measures, incentives, existing and new promotion and marketing approaches, pricing policies) necessary to increase and vary the provision of alternative protein foods, which would lead to overall healthy and sustainable dietary patterns in line with national recommendations.**
- Taking into account several key elements for the provision of alternative protein sources, e.g. shelf life, food handling, affordability (including externalities in prices of unhealthy and unsustainable diets), trade-offs between various food provision routes, developing new varieties of protein sources and rediscovering/valorising old varieties, traceability, and preserving flavour and natural resources (this would therefore be linked to the outcome of projects funded under the HORIZON-CL6-2021-FARM2FORK-01-12 topic: Filling knowledge gaps on the nutritional, safety, allergenicity and environmental assessment of alternative proteins and dietary shift). Gender aspects could also be considered.
- Exploring how the food environment can become 'crisis-proof' (whether something can be learnt from or has changed with the COVID-19 pandemic): creating resilient local, regional or European food systems that provide food and nutrition security for Europeans in a way that protects against future disruptions in supply chains. One way of doing this is by diversifying diets and providing people with alternative sources of protein.
- Clearly explain how the proposal will deliver co-benefits to each of the Food 2030 priorities: nutrition for sustainable healthy diets, climate, biodiversity and environment, circularity and resource efficiency, innovation and empowering communities (e.g. meeting the needs, values and expectations of society in a responsible and ethical way).

Call – Fair, healthy and environmentally-friendly food systems

- **Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.**
- Implementing the required multi-actor approach (see the eligibility conditions) by involving a wide diversity of food system actors and conducting trans-disciplinary research. Proposals should also promote international cooperation. Where relevant, activities should build and expand on the results of past and ongoing research projects (especially the four projects funded under the LC-SFS-17-2019 topic: Alternative proteins for food and feed). Projects should have a clear plan on how they will work with other projects selected under this topic (if funding of more than one project is possible). They should participate in joint activities, workshops, focus groups or social labs, as well as organise common communication and dissemination activities and show potential for upscaling. Applicants should plan the necessary budget to cover these activities.
- **This topic should involve the effective contribution of SSH disciplines.**

Type of action	Innovation Action
Deadline	**15 February 2022**
Call identifier	EUR 12.00 million
Topic information	Link
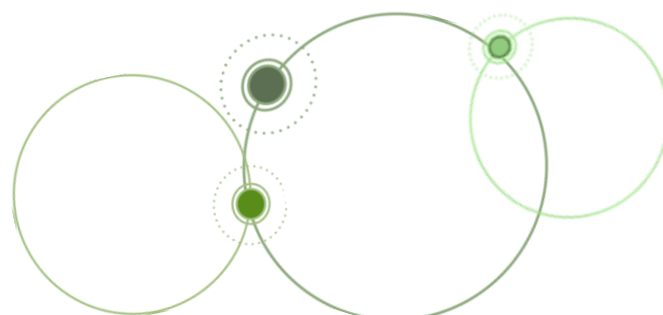
HORIZON-CL6-2022-FARM2FORK-01-08: Research and innovation for food losses and waste prevention and reduction through harmonised measurement and monitoring

Expected Outcome

In line with the European Green Deal priorities, and in particular the farm to fork strategy for a fair healthy and environmentally friendly food system, as well as with the EU's climate objectives, the successful proposals should support prevention and reduction of food losses and waste. They should therefore contribute to creating sustainable, healthy and inclusive food systems that deliver co-benefits for climate mitigation and adaptation, biodiversity, environmental sustainability and circularity, sustainable healthy nutrition and safe food consumption, food poverty reduction and empowerment of communities, and thriving businesses.

Projects results are expected to contribute to some of the following expected outcomes:

- Successful implementation of the harmonisation of food waste measurement across Europe, supported by the development of new tools across the food system on land and at sea, from farm to fork, producing reliable and comparable data on food and waste (area A);
- With respect to food losses at the primary production stage:
    - robust measurement of the magnitude of food losses at the primary production stage (i.e., agriculture, fisheries and aquaculture) at Member States and the EU levels for various commodities and at aggregated level, thereby contributing to the prevention and reduction of such losses (area B);
    - better understanding of the drivers (root causes) of food losses at the primary production stage and identification of ways for policymakers and primary producers to prevent and reduce them (area B).
- Well-informed and more effective policy and business strategies for preventing and reducing food losses and waste across the food system on land and at sea, from farm to fork (area A and B).

Scope

Each year, a substantial amount of food is lost or wasted all along the food value chain, from primary production to final consumption. Food losses and waste have negative impacts on the society, the environment and the economy. They contribute to food insecurity and hinder nutrition, generate GHG emissions and create pressure on land and water, including through habitat degradation and biodiversity loss, and are responsible for great economic losses. Such negative impacts are exacerbated in times of crisis such as the current COVID-19 pandemic, when additional food losses and wastes are generated by disruptions in food supply chains. Preventing and reducing the amount of food intended for human consumption that is eventually lost or wasted is a complex challenge. The robust and reliable measurement and monitoring of food losses and waste is key to tracking progress made over time and informing the development and implementation of effective strategies and actions.

The recent adoption of the EU Commission Decision (EU) 2019/1597 set a common method and minimum quality requirements for the uniform measurement of levels of food waste at the national level. However, since thoroughly assessing food losses at the primary production stage is difficult, time-consuming and costly, the common EU method excludes measurement of food losses at this stage. In addition to this lack of information about the levels of food losses at the primary production stage, there is also insufficient understanding of the root causes and drivers behind these losses, and this is key to developing effective strategies for preventing and reducing them.

Proposals responding to this topic should address one of the two complementary areas:

A. Develop cost-efficient food waste-relevant data collection, integration and analyses based on a large number of varied sources (e.g. households, food services, other small business), as well as on food discarded through wastewater, in order to improve the mapping of current food waste profiles at European and national level. To this end, proposals should speed up the innovation process and develop and test new technologies and tools along the food systems – from farm to fork, on land and at sea.

B. Develop and validate new tools and methods to measure and estimate food losses at the primary production stage, including storage of products originating from agriculture, fisheries and aquaculture. These new tools and methods should be applied and food losses at primary production stage measured across a large enough sample of diverse farms/production systems and value chains (including organic and agroecological), for a wide range of the most important commodities produced in the EU, across several years and in all Member States. This should generate robust measurement/estimation of food losses at the primary production stage for different commodities, at the Member State and EU levels, and at an aggregated level. Where relevant, measurements from Earth observation platforms may be used. To minimise data collection bias, each Member State should create a pool of trained researchers who are able to use the method and directly measure the food losses at the primary production stage. In addition to measurement, the direct and indirect drivers and root causes of food losses at primary production stage should be thoroughly investigated. Particular attention should be paid to the identification of market driven food losses at the primary production stage, to assess the potential for a reduction strategy based on marked demand shifts. Generated insights should also allow for identification of possible ways to prevent and reduce food losses at the primary production stage.
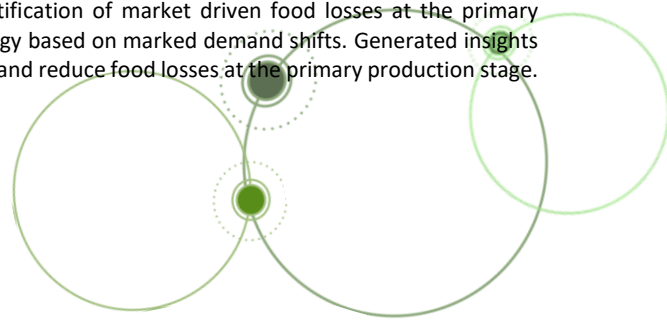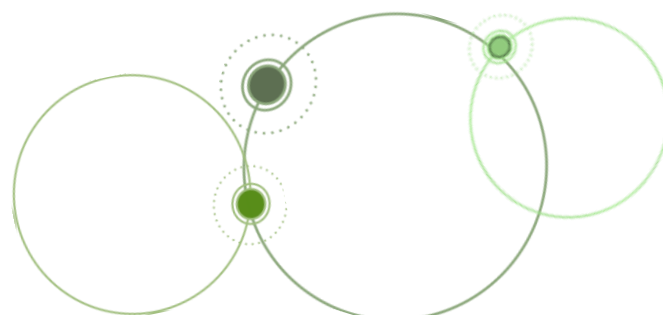
Call – Fair, healthy and environmentally-friendly food systems

Proposals should provide recommendations for policymakers and best practice guidelines/business strategies for researchers and relevant operators across the various diverse terrestrial and aquatic food value chains. Proposals should build on the work done by the Commission's Joint Research Centre in support of the EU Platform on Food Losses and Food Waste and be aligned with the environmental footprint method developed by the Commission. The possible participation of the JRC in the project would consist of gathering data collected in the projects into a consistent framework for modelling food losses and waste, integrating life cycle assessment considerations in the projects, in particular in the assessment of food losses and waste prevention intervention and food innovation, helping translating results into policy relevant outputs. Proposals should deliver on the food waste reduction and prevention targets relevant to the farm to fork strategy, across the food systems. In addition, in area A, they should also explain how they will deliver co-benefits on the four Food 2030 priorities: nutrition for sustainable healthy diets, climate and environment, circularity and resource efficiency, and innovation and empowerment of communities.

In area A, the required multi-actor approach must be implemented by conducting inter- and trans-disciplinary research and involving a wide diversity of food system actors, with special attention paid to consumers and civil society organisations. Proposals are encouraged to build on past or ongoing EU-funded research and work together with relevant initiatives including the European Commission Platform on Food Losses and Food Waste. They should set out a clear plan on how they will work with other proposals selected under this and any other relevant topics, e.g. by participating in joint activities and workshops, or by running common communication and dissemination activities.

This topic should involve the effective contribution of SSH disciplines. **Proposals should take into account and address inequalities, whether they be due to gender, race or other social categories.**

Type of action	Research and Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 7.00 million
Topic information	Link

Call – **Fair, healthy and environmentally-friendly food systems**

HORIZON-CL6-2022-FARM2FORK-01-09: Microbiomes in food production systems

Expected Outcome
The successful proposal will be in line with the European Green Deal priorities and the farm to fork strategy for a fair healthy and environmentally friendly food system, as well as with the EU's Climate ambition for 2030 and 2050. It will support R&I to foster advances in microbiome-related research for more sustainable agricultural food production. This in turn will contribute to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), biodiversity, environmental sustainability and circularity, dietary shift, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses. Project results are expected to contribute to all of the following expected outcomes:

- More nutritious and diverse plant-based food produce and products, based upon diverse microbiomes.
- Knowledge that leads to microbiome based understanding as needed by the industry on the interaction of plants (e.g. secondary metabolites) and of plant microbiomes with animal and human microbiomes. This is within the context of animal/human health effects, and of plants hosting plant/human/animal pathogens or other microorganisms causing quality and safety problems.
- Enhanced "translational research", which generates and applies knowledge that can improve human health and environmental practices and contributes to yield stability and food and nutrition security.
- Strengthened relationships between all actors involved in our food systems (e.g. farmers, and consumers) by offering transparency of business strategies, including related integrated assessments and decision support tools.

Scope
Diversity is increasingly important and is fundamental to achieving the UN Sustainable Development Goals 2, 3, 12, 13, 14 and 15. To introduce such diversity there is a need to implement research and innovation, education, communication, regulation and policy at (multi-)national and European level addressing existing food systems-related microbiome research gaps from laboratory to the field to food production ecosystems. This includes the interaction of food chain microbiome components from the soil to the plant/animal to the plate. We require a better understanding of the interaction of microbial biodiversity of plant/animal/human microbiomes and other biological processes in the larger food and animal/human health context. This is based upon an understanding that plant/animal/human microbiome/ microbiota comprises all microorganisms, including pathogens, and beneficial microorganisms. The scope covers plant/animal/human/food microbiome interactions that can provide healthier food and reduce human health and environmental risks, and contribute to restoring biodiversity, enhanced circularity, and climate change adaptation. A better understanding of the potential (direct or indirect) interactions between plant/animal/human/food microbiomes should be achieved.

Successful proposals should directly link their R&I coverage with other related intervention actions developing microbiome products and knowledge. In the medium term, food products grown and processed under optimised conditions favouring positive interactions with the microbiome must be harvested and delivered at comparable costs to those originating in today's conventional farming or intensive agriculture systems. This should be achieved while ensuring that the microbiome-solutions have low risk for consumers, farmers and other users, and the environment, maintaining the economic balance of production facilities and preventing dramatic economic losses, in particular to primary producers. New products may seek EU market regulatory approval, thus proposals should address relevant EU regulatory requirements as well as EFSA safety guidance and risk assessment and health outcomes verification.

Proposals are expected to address the following:

- The characterisation and development of microbiomes and their downstream products providing dietary diversity for improved human and animal health, and resilient food production systems.
- Mapping and provision of the arising co-benefits relevant to the four Food 2030 priorities: nutrition for sustainable healthy plant-based food and feed as well as those relevant to different socio-economic and cultural groups.
- Increasing knowledge and understanding of the biological and ecological processes involved in the assembly and dynamics of plant microbial communities, particularly microbial invasion and persistence, all along the production chains to deploy microbiota shaping-based strategies to improve the quality and safety of food products.
- **Designing multi-objective multi-region microbiome/diet transition pathways for EU food systems**, gathering all aspects of sustainable food systems and diets, health and safety parameters, biodiversity climate and environmental factors, circularity and resource efficiency, innovation and empowerment of communities, **traditional and cultural resources.**
- Seek international cooperation (such as with the International Bioeconomy Forum, the 'one planet sustainable food systems' programme, etc.), along with early and wide communication of microbiome science and applications.
- Address food industry needs, particularly personnel training in classical microbiology and modern microbiome skills; the closing of regulatory loopholes for microbial products; and the demarcation of research levels providing better differentiation to the companies developing the products.

The required multi-actor approach (see eligibility conditions) must be implemented by involving a wide diversity of food system actors and conducting inter- and trans-disciplinary research engaging consumers and civil society organisations. Proposals are encouraged to build on past or ongoing EU-funded research, research infrastructures and collaborate with relevant initiatives, including the Horizon Europe mission in the area of soil health and food international cooperation, the

International Bioeconomy Forum, the 'one planet sustainable food systems' programme, etc. The proposals should set out a clear plan on how it will collaborate with other related proposals selected under this and any other relevant topic/call, by participating in joint activities, workshops, as well as common communication and dissemination activities.
This topic should involve the effective contribution of SSH disciplines.

Type of action	Research and Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

HORIZON-CL6-2022-FARM2FORK-01-10: Integrated surveillance system to prevent and reduce diet-related non communicable diseases (NCDs)

Expected Outcome
In line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environmentally friendly food system, as well as with the EU's climate ambition for 2030 and 2050, the successful proposal will support R&I aiming to reduce diet-related non-communicable diseases (NCDs). It will contribute to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), environmental sustainability and circularity, dietary shifts, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses. Project results are expected to contribute to all of the following outcomes:

- Improving public health by introducing improved NCDs biomarkers.
- Better understanding of human (male and female) physiology, metabolic regulation and the links between all aspects of nutrition and health, microbiome and disease development.
- Robust and reliable knowledge base on variations in human health in response to nutrition and other relevant factors. Translation of this knowledge into innovative and effective food and nutrition solutions to improve people's health and wellbeing in ways that are adapted to women and to men, while simultaneously taking into account other dimensions of sustainability such as climate and the environment
- Comprehensive evidence base on links between nutrition/health and disease by conducting hypothesis-driven studies and adopting more integrated research approaches.
- Improved public awareness and a healthier diet which will reduce NCDs in particular in vulnerable population groups across Europe, addressing health inequalities.

Scope
Unsustainable and unhealthy diets, with an increased demand for livestock products and calorie-dense and nutrient-poor foods that are often highly processed (high in calories, sugars, sodium/salt, saturated fat and alcohol, and low in wholegrains, fruits and vegetables, legumes, nuts and seeds), are the leading NCD risk factor and a driver of high obesity rates. In Europe, at present, more than half of the adult population is overweight or obese, and children and population groups of lower socio-economic status are the most severely affected. NCDs such as cardiovascular diseases, cancers, chronic respiratory diseases and diabetes are responsible for the deaths of 41 million people each year, equivalent to 71% of all deaths globally. NCDs have a negative impact on both lives and health budgets but are largely preventable through effective interventions that tackle shared risk factors (such as unhealthy diets, physical inactivity, tobacco use and alcohol abuse). The complexity of the interactions between diet and human health requires multi-level engagement and inter- and transdisciplinary approaches to improve public health and reduce Europe's major health and economic burden. The development of new societally acceptable approaches/strategies/tools for healthy and sustainable diets that reduce diet-related NCDs requires a systemic approach involving a wide diversity of actors and sectors at different levels (from local to international). These include policy makers and public authorities, health care providers, schools and higher education establishments, food producers and processors, retailers, hospitality and food services (e.g. restaurants, canteens), researchers, non-governmental consumer and patient organisations, science brokers and private individuals.

Proposals should consider a range of diet-related NCDs, geographic, socio-economic, behavioural and cultural factors. The gender dimension of the research is particularly important for this topic. Data collected and integrated by the private and public sectors should be broken down by gender and by socio-economic groups. Where relevant, activities should build and expand on the results of past and ongoing research projects. Selected projects under this topic (and under the HORIZON-HLTH-2022- STAYHLTH-01-05-two-stage topic: Prevention of obesity throughout the life course) are strongly encouraged to participate in joint activities as appropriate, possibly in the form of project clustering, workshops, etc. Proposals are expected to show
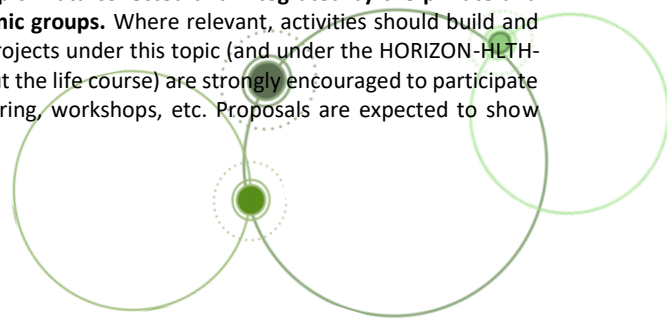
support for common coordination and dissemination activities. Applicants should plan the necessary budget to cover such activities.

Proposals are expected to address the following:

- **Mapping and monitoring of the diet-related NCD situation** (e.g. cardiovascular and heart diseases, obesity, diabetes, cancer and allergies) at the EU level, **based on a literature review to better understand the relationship between lifestyl**e (including diet, nutrition and alcohol, physical activity), physiological and genetic parameters including the human microbiome, **gender and sex, geographical placement** (national/regional/neighbourhood and rural/urban zone), **socio-economic, cultural and environmental (with particular reference to the human exposome) factors,** biological parameters (including genomics and microbiomes), and the risk of NCDs.
- Development of standardised methods for collecting (missing) data, using existing data/studies/cohorts and increasing the use of big data and artificial intelligence to elucidate the complex interactions between diet and human health.
- Development of advanced and easy-to-use biomarkers of risk/response for NCDs, including non-invasive and microbiome-based ones.
- Assessment and monitoring of the impact of existing measures/interventions/policies in the EU on reducing NCDs.
- **Investigating and generating a strong evidence base for the key physiological processes involved in the development of NCDs and how they may be affected by nutrition (from specific nutrient, dietary components to foods and dietary patterns) and other factors (e.g. geographical, biological, socio-economic, cultural, environmental, educational), taking into account individual genotype-phenotype status**.
- Development of a strong evidence base on the risks of unhealthy diet and unhealthy food (high in calories, sugars, sodium/salt, saturated fat and alcohol, low in wholegrains, fruits and vegetables, legumes, nuts and seeds, and often highly processed) within the development of NCDs versus healthy food/products.
- Identifying high risk/vulnerable populations across Europe, better understanding their predisposition to diet-related diseases, and designing specific hypothesis-driven research and well-controlled intervention studies with very strict conditions to reduce dietary and health inequalities in different countries, regions, rural and urban areas.
- **Developing more targeted recommendations for effective and cost-efficient integrated policies (such as social, fiscal, regulatory, marketing) in the short-, medium- and long term.** These are to support Member States and associated countries and policy makers in designing effective and cost-efficient policies that focus on prevention and promote healthy diets to reduce diet-related NCDs, taking into account environmental, gender, social and economic sustainability aspects.
- **Undertaking risk/benefit cost analyses for the different options proposed to better predict and understand effective and long-term impacts and facilitate informed policy decisions and societal debate.**

The required multi-actor approach (see the eligibility conditions) must be implemented by involving a wide diversity of food system actors and conducting inter- and trans-disciplinary research.

This topic should involve the effective contribution of SSH disciplines.

Type of action	Research and Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 11.00 million
Topic information	Link
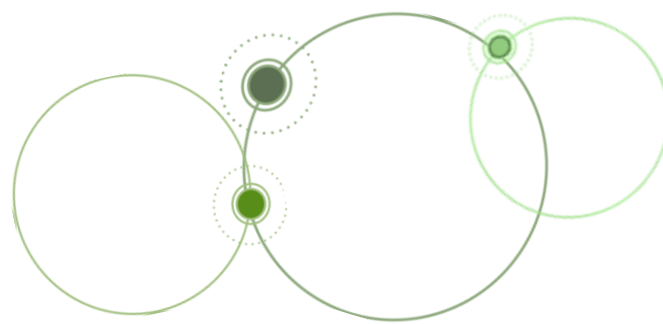
Call – **Fair, healthy and environmentally-friendly food systems**

HORIZON-CL6-2022-FARM2FORK-01-11: Effective systems for authenticity and traceability in the food system

Expected outcome

In line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environmentally friendly food system, the successful proposal will support R&I in improving traceability and combating food fraud along the food supply chain. It will contribute to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), environmental sustainability and circularity, dietary shifts, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses. Project results are expected to contribute to all of the following outcomes:

- A robust knowledge base of the underlying reasons for/drivers of food fraud (e.g. economic and social) and the extent of food fraud.
- Innovative strategies and solutions (tools and devices) to prevent fraudulent practices by improving traceability and safeguarding authenticity, and fostering solutions for fraud prevention.
- Improved assistance to control bodies and authorities in fraud prevention.
- Improved transparency through digital solutions (such as IoT, artificial intelligence, blockchain and distributed ledger technologies) that meet consumer demand for food transparency, with a focus on demonstrating authenticity of food as a way to reduce food fraud and boost consumer confidence in food origin and quality.
- Contribution to further development of policies for food authentication and traceability and for fighting food fraud/food crime.
- Support official control by providing guidance on detection and mitigation of fraudulent practices.

Scope

To contribute to the goals of the farm to fork strategy, the EU will scale up its fight against food fraud to create a level playing field for operators and strengthen the powers of control and enforcement authorities. The new EU Official Controls Regulation (Regulation (EU) 2017/625) includes key provisions in relation to food fraud. Recently, the issue of food fraud has been thrust into the spotlight and is of increasing concern to society and to the food industry. It can have very different impacts on consumers, ranging from direct health threats (e.g. consumption of toxic adulterants and contaminants) to violation of consumer rights (e.g. mislabelling). With the complexity of the global market and the addition of e-commerce, the safety risks of food fraud are likely to increase. Therefore, there is a constant need for sensitive and accurate authentication methods and innovative traceability methods to prevent food fraud and help the industry and official control authorities. Maintaining the integrity of European foods is vital to protect both consumers and the legitimate producers, industry and retail, and foster consumer confidence in the authenticity of all food products.

Successful proposals are expected to address both areas (area A and area B):
Area A:

- **Take stock and determine the current state-of-the-art, identify gaps, and suggest short-, medium- and long-term strategies for closing gaps in research addressing various aspects of fraud such as societal and economic drivers, fraud opportunities, mitigation and prevention measures**.
- **Quantify the economic dimension of the food fraud problem and understand the behaviour of food criminals perpetrating food fraud.**
- **Carry out translational research on fraud detection methods to provide the required evidence base for harmonisation and standardisation of methods and harmonisation of strategies for regulatory use.**
- Develop and validate rapid food fraud detection tools and real-time in-situ/on-line analytical methods for testing authenticity and quality.
- Develop and implement new food fraud detection models (based on data, by applying artificial intelligence techniques) and tracing methods through the use of new and emerging technologies, such as blockchain and smart labelling tools.
- Build common platforms and tools for sharing information among stakeholders.

Area B:

- Support the development of an early warning system (EWS) for detection and possible further prevention of fraudulent practices and an efficient use of artificial intelligence, taking into consideration the data protection rules in place.
- Evaluate the utility of different food-authenticity-related databases existing in Member States and the EU institutions, and create a central database/data portal for further use of these data by authorised users to improve fraud detection and enforcement actions by the competent authorities.
- **Develop tools that increase consumers' confidence in the authenticity and quality of the food supply, in line with the relevant legal frameworks**.
- **Investigate food chain stakeholders' attitudes towards adulterated food to understand better their motivation to commit fraud and trade-in inferior quality goods.**

The required multi-actor approach (see the eligibility conditions) must be implemented by involving a wide diversity of food system actors and conducting inter-disciplinary research. Proposals should bring together major stakeholders and scientific
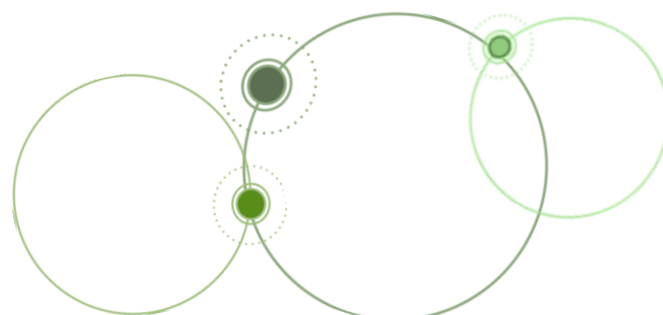
expertise to protect consumers and industry from food fraud. Projects relevant to this topic should support policymaking and implementation relevant to fighting food fraud. Proposals should explain how they will contribute to achieving the objectives of the farm to fork strategy and deliver co-benefits to the four Food 2030 priorities.

Proposals should involve a wide diversity of actors and implement an inter- and trans-disciplinary approach. They are encouraged to build on past and ongoing EU-funded research, and are strongly encouraged to cluster with upcoming projects under the HORIZON-CL6- 2022-FARM2FORK-01-04 topic: Innovative solutions to prevent adulteration of food bearing quality labels: focus on organic food and geographical indications. They are also strongly encouraged to work with existing research infrastructure and collaborate with relevant initiatives, including specifically the European Commission's Joint Research Centre (JRC) Knowledge Centre for Food Fraud and Quality, which provides expertise in food science, authenticity and quality of food supplied in the EU. The possible participation of the JRC in the project will ensure that the project deliverables are compatible with and/or improve existing databases and tools used at the European Commission and foster open access to project results via dissemination through the European Commission Knowledge Centre for Food Fraud and Quality, particularly to the competent authorities of the EU Member States.

Proposals should set out a clear plan on how they will work with other projects selected under this and any other relevant topic, by participating in joint activities and running common communication and dissemination activities. Applicants should plan the necessary budget to cover these activities. In this topic the integration of the gender dimension (sex and gender analysis) in research and innovation content is not a mandatory requirement.

This topic should involve the effective contribution of SSH disciplines.

Type of action	Research and Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 10.00 million
Topic information	Link

Call – **Fair, healthy and environmentally-friendly food systems**

HORIZON-CL6-2022-FARM2FORK-01-13: AU-EU Combatting all forms of malnutrition

Expected outcome

In line with the European Green Deal priorities and the farm to fork strategy for a fair, healthy and environmentally friendly food system, as well as with the EU`s climate objectives for 2030 and 2050, the EU's "Comprehensive Strategy with Africa" calls for the EU to "partner with Africa to maximise the benefits of the green transition and minimise threats to the environment". It states that: "The EU and Africa must join efforts to reach the Sustainable Development Goal of zero hunger and address the challenges of nutrition and food security by boosting safe and sustainable agri-food systems." In support of this strategy, the EU and the African Union are implementing a ten-year roadmap (2016- 2026) on research and innovation in food and nutrition security and sustainable agriculture to which the successful proposal will contribute. This will help to transform food systems to deliver co-benefits for climate (mitigation and adaptation), environmental sustainability, biodiversity and circularity, dietary shift, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses. An estimated 821 million people are currently undernourished, and 151 million children under five years of age are stunted. At the same time, the number of overweight and obese people is increasing rapidly in Europe and Africa, with no signs of slowing. This research and innovation action (RIA) will build on the international dimension of the farm to fork strategy. It relates to evidence presented by the EAT Lancet report and the 2020 Global Nutrition Report. It contributes to the agenda and follow-up of the 2021 UN World Food Systems Summit.

A successful proposal will develop and test approaches to innovations that improve nutrition through a deeper understanding of the unmet nutritional needs, aspirations, behaviours and preferences of consumers who remain underserved by markets and face limited access to affordable nutritious foods.

Projects results are expected to contribute to all of the following expected outcomes:
- Better informed nutrition policies that can be scaled-up by initiatives such as SUN (scaling-up nutrition).
- Improved nutrition in African countries reducing all forms of malnutrition through safe, healthy and affordable diets, including dietary shifts, that reduce the pressure of food production on land and water use and reduces the climate footprint of downstream activities from farm to fork.
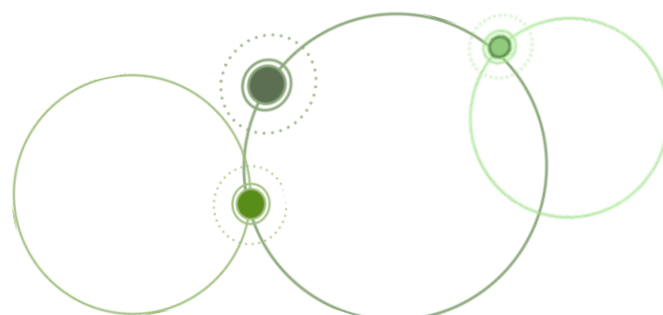
Scope

Proposals are expected to address the following:
- **Mapping and monitoring of dietary patterns at national/regional/rural/urban levels relevant to different socio-economic and cultural groups, including low-income settings, the most vulnerable, rural food environments and for those in conflict or protracted-crisis situations to better understand what people are eating and how they make food choices**
- Contribute to standardised metrics and tools to measure the food environment. In many food systems the absence of formal channels to acquire food lead to a dynamic, self-sufficiency and unregulated retail food environment with a large proportion of informal food vendors. This results in enormous variety in metrics in terms of reference points (i.e. food accessibility), media coverage (i.e. food promotion) and level of implementation (i.e. policies).
- **Improved knowledge and measurement of the factors influencing dietary behaviour in selected African countries, and development of effective means for each food system actor to share food knowledge and improve food behaviour.**
- Assessment of the value of and potential for scaling-up of sustainable traditional food knowledge based on access to biodiverse agro-ecological situations.
- **Assessment of innovations to improve nutrition, driven by a deep understanding of the unmet nutritional needs, aspirations, behaviours and preferences of consumers** who remain underserved by markets and face limited access to affordable nutritious foods.
- **Innovative and effective tools to improve education, communication, engagement and training on sustainable healthy nutrition and diets, and more generally on sustainable food systems adapted to different population groups in respect of their age, culture and needs and considering gender.**
- Provision of a scientific basis for sharing food knowledge and developing dietary advice to support policy makers to empower individuals to adopt healthy and sustainable food behaviour, as a win-win for both their health and the environment.
- **Supporting the development of new integrated policy-making and implementation efforts** such as the scaling-up nutrition initiative within and across countries (at multiple levels). This will support healthier and sustainable dietary behaviours and lifestyles with the provision of innovative, efficient, effective, evidence-based and ready-to-use tools/strategies including cost-benefit assessment of the different options proposed.
- **Contributing to the mapping and monitoring of mycotoxin effects in unsafe foods and diet-related non-communicable diseases (NCDs) to better understand the relationship between lifestyle** (including mycotoxin levels, diets, nutrition and alcohol), **gender, geographical, socioeconomic and environmental factors**, biological parameters, and the risk of development of diet related NCDs.
- **Development of innovative and effective policies/strategies/tools contributing to reduce dietary and health inequalities as precursors of NCDs, in particular in vulnerable population groups.**

- **A space for mentoring and acceleration of innovative business concepts, including social innovation and upscaling for promising approaches using cascading funding opportunities.**
- When relevant, creating links to and using the information and data of the European Earth observation programme Copernicus, the Group on Earth Observations (GEO) and the global Earth observation system of systems (GEOSS).
- Include a clear plan on collaboration with other projects selected under this topic, other nutrition related EU projects and similar projects funded under the EU-AU HLPDFNSSA priority from different funding sources including Horizon 2020 and Horizon Europe, ERA-Nets, African Union research grants, DeSIRA or PRIMA. They should contribute to the work of the FNSSA-working group (WG) by linking to the LEAP4FNSSA project supporting the FNSSA-WG secretariat. They should participate in joint activities, workshops, and communication and dissemination activities and show potential for upscaling. Applicants should plan the necessary funding to cover these activities.
- **Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake**. **This topic should involve the effective contribution of SSH disciplines.**

Type of action	Research and Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 11.00 million
Topic information	Link

Call – Fair, healthy and environmentally-friendly food systems

HORIZON-CL6-2022-FARM2FORK-01-14: African food cities

Expected outcome

In line with the European Green Deal priorities and the farm to fork strategy for a fair healthy and environmentally friendly food system, as well as with the EU's climate objectives for 2030 and 2050, the EU's "Comprehensive Strategy with Africa" calls on the EU to "partner with Africa to maximise the benefits of the green transition and minimise threats to the environment". In support of this strategy, the EU and the African Union are implementing a ten-year roadmap (2016-2026) on research and innovation in food and nutrition security and sustainable agriculture to which the successful proposal will contribute. It will also contribute to the transformation of food systems to deliver co-benefits for climate (mitigation and adaptation), environmental sustainability and circularity, dietary shift, sustainable healthy nutrition and safe food, food poverty reduction and empowerment of communities, and thriving businesses. Urban areas contribute significantly to global food-system related emissions and food waste. Urban growth often happens at the expense of natural resources. Urban areas are increasingly affected by the double burden of malnutrition: high prevalence of undernourishment and undernutrition and increasing obesity and the spread of non communicable diseases.

A successful proposal will build on initiatives like the Milan Urban Food Policy Pact (MUFPP), on the FAO urban food agenda and upon the recommendations of the Task Force Rural Africa report. It will address big, intermediate and small cities and towns. It will address the fact that poorly planned urban food systems lack opportunities to link rural and urban food producers, markets and consumers, and limit the access of vulnerable groups to safe and healthy nutrition.
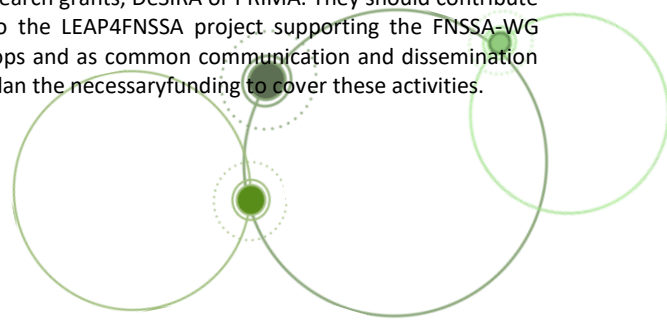
Projects results are expected to contribute to all or some of following expected outcomes:

- A shift to food security and improved nutrition in five African cities (could encompass rural urban centres and   cities) through a shift to healthy and affordable diets that reduces the pressure of food production on land and water use and reduces the climate footprint of downstream activities from farm to fork.
- Reducing the food-system-related environmental footprint, improving circularity (e.g. food and packaging waste), and providing citizens with new, sustainable and healthy products.

Scope

Proposals are expected to address the following:

- **Understanding: promoting multi-stakeholder collaborations in assessing data on food challenges (including harmful marketing and advertising and unequal access to healthy food for the urban poor), and identifying opportunities and indicators in developing urban food policies**.
- Engaging: mobilising a wide diversity of food system actors (from farm to fork, the public and private sector, and society, organic and conventional); in particular higher education institutions and research centres to work with local actors in support of evidence-based food policy development and to help provide local solutions to integrated food system challenges.
- Mutual learning: reinforcing or creating new networks of African cities and towns to share good practices and learn from and support each other. This implies also involving cities (in Africa, Europe or elsewhere) with well-developed food policies to provide guidance and lessons learned, as well as new forms of collaboration/twinning.
- **Innovation: proposals should envisage a space for mentoring and accelerating innovative business concepts, including social innovation and upscaling in view of African or European food business entrepreneurs with special consideration of women and the diaspora using cascading funding opportunities**. Proposals may involve financial support to third parties e.g. to academic researchers, start-ups, SMEs and other multidisciplinary actors, to, for instance, develop, test or validate developed assessment approaches or collect or prepare data sets or provide other contributions to achieve the project objectives. A maximum of EUR 60 000 per third party may be granted. Conditions for third parties support are set out in Part B of the General Annexes. Consortia need to define the selection process of organisations, for which financial support will be granted. A maximum 20% of the EU funding can be allocated to this purpose. The financial support to third parties can only be provided in the form of grants.
- Where relevant, creating links to and using the information and data of the European Earth observation programme Copernicus, the Group on Earth Observations (GEO) and the global Earth observation system of systems (GEOSS).
- Exploring how the food environment can become crisis-proof (whether something can be learnt from or has changed with the COVID-19 crisis) and how to create resilient local, regional food systems with border regimes, which do not disrupt supply chains.
- **Governance: developing and evaluating innovative multi-actor urban food systems governance processes and capacities for science-backed integrated policy making and implementation actions that deliver on the international collaboration dimension of the farm to fork strategy objectives and Food 2030 co-benefits for health, environment, climate, circularity and inclusion, while minimizing trade-offs.**
- EU-AU partnership: proposals should have a clear plan on how they will collaborate with other projects selected under this topic and similar projects funded under the EU-AU HLPD-FNSSA priority from different funding sources including Horizon 2020 and Horizon Europe, ERA-Nets, African Union research grants, DeSIRA or PRIMA. They should contribute to the work of the FNSSA-working group (WG) by linking to the LEAP4FNSSA project supporting the FNSSA-WG secretariat. They should participate in joint activities, workshops and as common communication and dissemination activities and show potential for upscaling. Applicants should plan the necessaryfunding to cover these activities.

- **Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake. This topic should involve the effective contribution of SSH disciplines.**

| Type of action	Research and Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 6.00 million
Topic information	Link

Topics with minor SSH relevance

HORIZON-CL6-2022-FARM2FORK-01-03: Enhancing biosecurity in terrestrial livestock production
Link

HORIZON-CL6-2022-FARM2FORK-02-05-two-stage: Innovative food from marine and freshwater ecosystems
Link
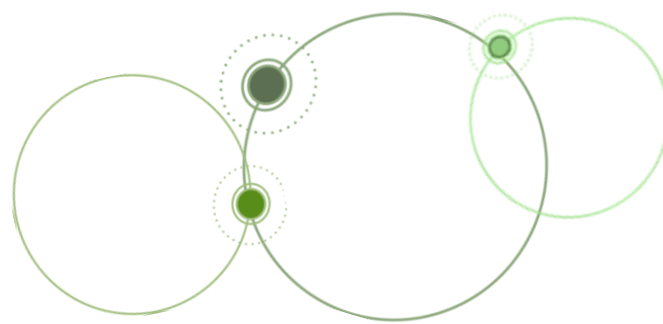
Call – Circular economy and bioeconomy sectors

HORIZON-CL6-2022-CIRCBIO-01-03: Benefits of the transition towards sustainable circular bio-based systems from linear fossil-based

Expected outcome

Successful proposals will support policy makers in their efforts to develop sustainable pathways to replace fossil and carbon-intensive systems with circular bio-based systems at the EU and regional scale, in line with the 2030 climate targets and European Green Deal objectives. Project outcomes will contribute to foster European industrial sustainability, competitiveness and resource independence.

Projects results are expected to contribute to the following expected outcome:

- Policies are designed to enable the transition from linear fossil-based systems to circular bio-based systems, setting priorities.

Scope

Abandoning the current linear fossil-based economy is a prerequisite for European Green Deal objectives and, in general, for preserving life on our planet. Biogenic resources are key means of mitigating climate change as they can strengthen natural and anthropogenic carbon sinks. Circular bio-based systems are part of the solution to achieving climate neutrality, where they replace carbon-intensive and fossil-based systems and are based on sustainably sourced biological resources. Policies must ensure that this transition from linear fossil-based to circular bio-based systems is sustainable and aims at i) climate change mitigation and adaptation; ii) increasing resource efficiency and circularity; iii) preserving and restoring natural resources, their ecosystem services and biodiversity; and i) ensuring a just transition for everyone. Policies and priorities should be comprehensive and underpinned by a critical assessment of the environmental/social/economic impacts of the current linear fossil-based economy. That assessment should help individuating policy priorities, as well. **To support designing policies to transition away from linear fossil-based systems towards sustainable circular bio-based ones, proposals should:**

a. **Consolidate knowledge on current trends in terms of the environmental, economic and social limits of a linear carbon-intensive and fossil-based economy**. By limits, we mean technical and structural barriers and/or inability to reach local and global Sustainable Development Goals (e.g. SDGs, climate change mitigation targets, European Green Deal objectives). **Cultural and social limits should also be considered, including barriers related to gender and age.**

b. **Develop new/improve existing methodologies to assess environmental/social/economic impacts of linearity vs circularity in the economy, including on waste production and disposal, non-renewable resources exploitation and loss, geographically (and socially) unbalanced distribution of resources and growth, biodiversity loss at global and local scale.** The methodologies should consider circular economy indicators, methods and concepts developed or under development in existing initiatives, including Commission's ongoing work on the circular economy monitoring framework and R&I activities.

c. **Assess the environmental/social/economic impacts of the EU's current linear fossil-based economy**. This should include aspects related to the geographical distribution of oil origins and global trade, direct and indirect environmental impacts of fossil-based value chains on a life cycle base, including on, but not limited to, climate change, resource use including land, water and marine space, air/water/soil quality, ecosystems services and biodiversity. **Costs arising from environmental and social impacts should be internalised in the economic impacts assessment.**

d. Develop and compare multiple scenarios of transitioning from fossil-based to circular bio-based systems, modelling the replacement of the fossil-based activities, with a focus on the most carbon-intensive ones, with bio-based systems, including innovative solutions, at EU and global scale. **Environmental/social/economic impacts of bio-based systems should be assessed with validated methodology, considering also the benefits of applying a circular approach to the bio-based systems.** Biogenic carbon capture utilization (BCCU) solutions for bio-based systems via nature-based solutions (e.g. in soils or long-term circular bio-based materials) should be part of the assessment. **Scenarios should compare the impacts of fossil-based and bio-based solutions, and include social aspects and social innovation, especially at the socio-technical interfaces of innovative solutions.**

e. Identify knowledge gaps in the assessment of the sustainability of the transition from fossil-based to circular bio-based systems and in the comparison between alternative scenarios as described under point d).

f. Identify priorities in the transition from fossil-based to circular bio-based systems, according to scenarios analysed in the project and develop guidelines and policy recommendations.

Proposals should include a task dedicated to sharing methodologies and findings with projects funded within this topic.

This topic should involve the effective contribution of social sciences and humanities (SSH) disciplines.

Type of action	Coordination and Support Action
Deadline	15 February 2022
Expected EU contribution per project	EUR 2.00 million
Topic information	Link
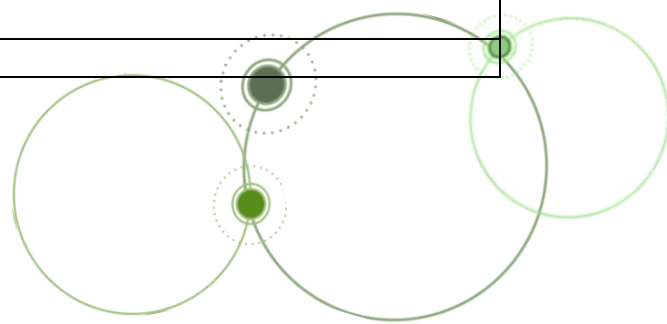
Call – Land, ocean and water for climate action

HORIZON-CL6-2022-CLIMATE-01-01: Climate sensitive water allocation systems and economic instruments

<u>Expected outcome</u>

In support of the European Green Deal and EU water-related policies, successful proposals will contribute to foster the adaptation of water resources to climate change, in particular Destination 'Land, ocean and water for climate action' impact "Advance the understanding and science, and support adaptation and resilience of natural and managed ecosystems, water and soil systems and economic sectors in the context of the changing climate". Projects results are expected to contribute to several of the following expected outcomes

- Achieve transparent water sharing and adjust water allocation across environmental and human uses towards long-term water replenishment capacity and availability,
- Adopt inclusive, forward-looking and climate risk-informed water allocation planning and management processes, foster adoption of digital technologies in water management
- Guide decision makers in transboundary rivers to share transboundary waters equitably, reaping the benefits of appropriate water allocation regimes.
- Identify water efficiency deficiencies and achieve improvement by at least 50% by 2030, in regions under water stress, now or in the future, and for water bodies at risk of failing to achieve good ecological or quantitative status.
- Reduce the water footprint of water-using sectors, especially agriculture, energy and industry.
- Promote financing mechanisms to smoothen the transition to more appropriate water pricing policies in water supply and sanitation and in the different economic sectors, such as agriculture, energy and industry, taking into consideration the opportunities available in various EU (e.g. CAP, Cohesion Policy funds, etc.) and national funding mechanisms and policies.
- Help structure an appropriate policy dialogue to support water allocation reforms and increase stakeholders engagement.
- Support the implementation of the European Green Deal and the Sustainable Development Goals, notably the SDG 6 "Ensure availability and sustainable management of water and sanitation for all".

<u>Scope</u>

Current water allocation regimes are largely shaped by historical preferences and usage patterns. They are therefore usually not well equipped to deal with the growing water needs and intensifying competition of the different water use sectors, the impacts of climate changes, especially water scarcity and/or shifts in societal preferences, such as increasing value placed on water related ecological services. It is therefore important to assess current water allocation systems in different regions and sectors and to develop pertinent water allocation models that are able to perform well under both average and extreme conditions and could demonstrate adaptive efficiency in order to adjust to climate conditions.

Actions under this topic should address ways to value water appropriately, taking into account the multiple and diverse values of water to different groups and sectors, and ways to develop appropriate tariffs and prices to ensure access to water which should be available and affordable to all, while also securing adequate pricing policies allowing for systematic renewal of water service infrastructure. Actions should develop and demonstrate in relevant river basins and sectors, innovative tools / instruments on intelligent water allocation schemes relevant for decision-making recommendations (e.g. on permits). The opportunities for developing water allocation schemes based on digital technologies should be explored. The challenges for water allocation regimes, especially in developing countries, are also aggravated by weak water policies which contributes to structural water scarcity, increasing the risk of shortages for users and the environment. The interaction of policies, regulation and implementation mechanisms should be especially assessed, as well as, the interplay between conventional and non-conventional water resources (e.g. wastewater reuse, desalination, etc.). **Water allocation scheme in transboundary river basins should also be addressed with a view to developing an internationally accepted and standardised mechanism for allocation of water in cross-border river basins, by taking into account the various socio-economic and environmental disparities among these countries** and making transboundary waters an area of cooperation rather than conflict.

Climate change impacts on freshwater resources can have significant impacts on agricultural production resulting in destabilising effects on agricultural markets, food security and other non-agricultural uses. **Current water allocation regimes in agriculture should be reviewed in this context, with a view to developing the necessary combination of various adaptation measures, such as, water pricing, water use restrictions, improvement of water use efficiency, economic incentives**, water reuse, shifting to less water-requiring crops and fallowing, etc., to cope with the reduction of water availability anticipated in climate change scenarios.

International cooperation with non-associated third countries with transboundary rivers is encouraged.

In general, the participation of academia, research organisations, utilities, industry and regulators is strongly advised, as well as civil society engagement whenever necessary, also aiming to broaden the dissemination and exploitation routes and to better assess the innovation potential of developed solutions and strategies.

Type of action	Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	Between EUR 4.00 and 5.00 million
Topic information	Link

Topics with minor SSH relevance

HORIZON-CL6-2022-CLIMATE-01-04: Fostering the resilience of agricultural production: from observation of changes to the development of resilienc strategies
Link
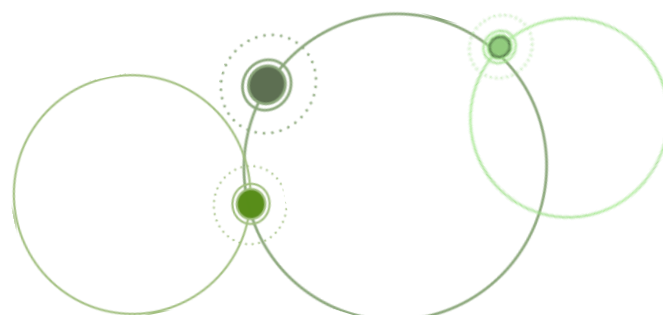
Call – Resilient, inclusive, healthy and green rural, coastal and urban communities

HORIZON-CL6-2022-COMMUNITIES-01-01: Boosting women-led innovation in farming and rural areas

Expected Outcome

The successful proposal will contribute to fostering a sustainable, balanced and inclusive development of rural areas, supporting the implementation of the European Green Deal, the EU farm to fork strategy, the European pillar of social rights, the European gender equality strategy and the EU long-term vision for rural areas. It will do so by increasing the understanding of the social and behavioural drivers of change, especially in relation with gender norms and relations and by favouring the deployment of women-led innovations in farming and rural communities. Improved knowledge of the specifics of women-led innovation, more supportive innovation ecosystems and smart solutions coming from women-led innovations will empower rural people to act for change and get farming and rural communities prepared to achieve climate neutrality by 2050, adapt to climate change, and turn digital and ecological transitions into increased resilience, good health and positive long-term prospects, including jobs for all, in particular women.

Projects results are expected to contribute to all of the following expected outcomes:

- more effective policy and governance frameworks and knowledge and innovation systems to boost women's roles in the sustainable development of rural areas and in innovation in farming, in the rural economy and in rural communities;
- improved understanding, awareness and recognition of women's role in the future of the farming sector (in particular ecological transitions), rural economies and communities and related innovation by policy-makers, rural citizens, innovation support services and scientists;
- combating and transforming gender norms and stereotypes, fostering broad social equalities and advancing Sustainable Development Goal 5 on gender equality; and
- enhanced capacity of rural women to innovate for change, including improved skills, solutions to challenges faced by rural women, stronger networks and enhanced knowledge flows from, between and towards women innovators in rural areas and in farming, facilitating the uptake and dissemination of successful innovations and innovation-support tools, in particular those contributing to ecological transitions.

Scope

The role that European women play in rural development and in farming is still widely under-researched. And so is their role as entrepreneurs and innovation leaders, the specifics of the innovations they develop and how the current governance framework contributes to boosting their innovation capacity or to hampering it. Current evidence suggests that this role is underestimated and that the potential of rural women to contribute to sustainability transitions remains partially untapped, in particular due to a lack of targeting in policy frameworks and innovation support systems.

Proposals should analyse the role that women play and will play in the future of rural areas considering megatrends in European rural economies and communities in general and in farming in particular (proportion of official and non-official farm labour, involvement in innovative activities, role in social capital, specific social challenges and risks, relation to environment and environmentally-friendly farming practices etc.), highlighting differences between and within studied countries. They should analyse the specifics of women-led or gendered innovations in farming and in rural communities (specific needs and challenges, sectors and activities, scope, outcomes and benefits, hurdles and obstacles, knowledge and support sources and various forms of social capital involved), the relevance of the agricultural and rural knowledge and innovation systems for women, including education, training and advice. To this end, proposals should actively support a number of practical user-centred women-led interactive innovation initiatives to create knowledge of the specifics of women-led innovation processes, favour exchanges across initiatives and derive new knowledge and practical tools for women, support organisations and policy makers at national (including Associated Countries) and EU level to enhance change. Proposals should benchmark EU and national policy and legal frameworks on farming and rural development for their gender equality performance, taking into account the new European gender equality strategy. They should also formulate recommendations on how to improve legal, policy or governance frameworks in rural economies in general and in farming in particular to support women-led innovation and women's role in farming and rural economies.

Proposals should be transdisciplinary, with a key role for social sciences and humanities (SSH) such as sociology, psychology, economics and innovation studies. This topic should involve the effective contribution of SSH disciplines. Social innovation should be considered alongside other types of innovation. Proposals must implement the multi-actor approach, involving women rural innovators and supportive organisations in all tasks alongside scientists, innovation support services and other relevant actors all along the project. The consortia and practical innovation initiatives supported should be located in a set of different locations representing the diversity of European rural socio-economic conditions. Proposals should include a task to coordinate with other proposals funded under this topic, as well as under topics on the 'expertise and training centre on rural innovation' (HORIZON-CL6-2021- COMMUNITIES-01-02), 'smart solutions for smart rural communities' (HORIZON-CL6- 2022-COMMUNITIES-02-01-two-stage), other relevant projects and with future common agricultural policy networks, to build synergies in engagement activities and dissemination and exploitation of results.
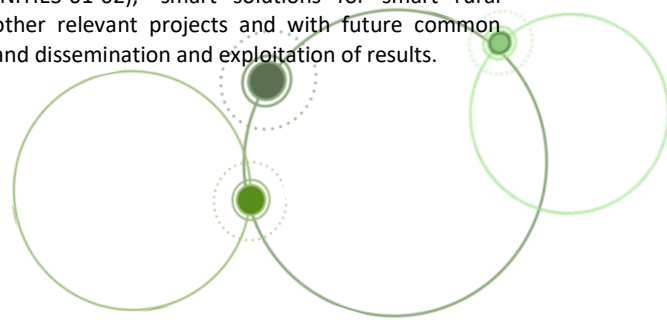
Call – Resilient, inclusive, healthy and green rural, coastal and urban communities

Type of action	Research and innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 3.00 million
Topic information	Link

HORIZON-CL6-2022-COMMUNITIES-01-02: Assessing and improving labour conditions and health and safety at work in farming

Expected outcome

The successful proposal will contribute to fostering a sustainable, balanced and inclusive development of rural areas, supporting the implementation of the EU farm to fork strategy, the European pillar of social rights and the long-term vision for rural areas. It will do so by increasing the understanding of the social and behavioural drivers of change, especially in relation with social inclusion, labour, health and safety aspects, and by favouring the deployment of innovations that improve labour conditions, health and safety in farming, equipping the sector with smarter and innovative solutions that increase opportunities for most vulnerable groups, improve attractiveness of farm work and reduce the feeling of being left behind. Improved knowledge leading to more supportive policy frameworks alongside practical innovations will empower people and businesses to act for change and get prepared to achieve climate neutrality by 2050, adapt to climate change, and turn digital and ecological transitions into increased resilience, good health and positive long-term prospects, including jobs, for all including women, young people and vulnerable groups. Project results are expected to contribute to all of the following expected outcomes:

- enhanced understanding and awareness by policy makers, farmers organisations, trade unions and health authorities of farmers' and farm workers' health and safety, and on the implications of the perceptions of their work on the future of the sector and hence on long-term food security;
- improved policy and governance frameworks favouring safer and more inclusive working environments for farmers and farm workers;
- wider use of corporate social responsibility innovations by farm businesses; and
- improved health, safety and labour conditions in farming thanks to better performing European and national policy and legal frameworks and innovative bottom-up initiatives.

Scope

Proposals should analyse health and safety at work issues in the farming sector with a specific focus on working conditions (and how they will evolve with digital transitions, climate change, health risks, regulatory developments on chemicals, farmers mental health, injuries, etc.) and labour conditions (seasonal patterns, working time, income and work outside legal contracts, including mobile EU and non-EU workers) also in relation to the perceived attractiveness of farming or working in farming as a job. They should analyse work risks and the vulnerability of farm workers of different genders and ages. They should engage with current and potential future farmers and farm workers on their perception of work in farming and their perspectives and plans for the future, including farm inheritance/take over, seeking to understand the attractiveness of the job (e.g. in relation to wages, stability, seasonality etc.). They should assess the impact of the type of labour force involved (family, local, external) on society and on the farm (including from the workers' perspectives) and the consequences in case of external shocks such as the recent COVID-19 pandemic.

Proposals should explore the potential of corporate social responsibility (CSR) initiatives and social economy and entrepreneurship to improve the situation of farm workers, including business models that reward improved working conditions through premium prices or other forms of reward, including for non-productive functions such as social inclusion, empowerment and care (non-EU good practices could be considered). They should analyse consumers' willingness to pay for more ethical working conditions and enabling conditions for market development in this arena. To this end, they should support social innovation, social entrepreneurship or corporate social responsibility pilots in a limited number of localities to serve as role models or positive examples to learn from and be scaled-up.

They should explore the policy implications of the outcomes (including regulation and control); benchmark policy design and delivery and make recommendations for improved policy frameworks at the right level of governance considering the various competencies involved (EU, national, regional etc.). Finally, they should develop training and education actions to raise farmers, farm workers, trade unions and farmers organisations awareness of health-protecting innovations that can be scaled up.
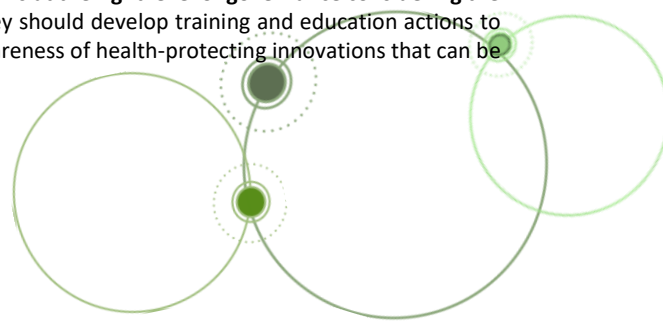
Call – Resilient, inclusive, healthy and green rural, coastal and urban communities

Proposals must implement the multi-actor approach, bringing together multiple science fields, in particular the social sciences and humanities (SSH) (e.g. sociology, behavioural sciences, psychology etc.), actors with complementary knowledge of health, employment, farm contracts, taxation etc., farmers and farmer organisations or trade unions and support groups for farmers facing difficulties. This topic should involve the effective contribution of SSH disciplines. Proposals should cover a representative variety of countries and sectors at least in the EU, covering in particular countries and sectors in which intra-EU and non-EU mobile workers are a significant part of the sector's labour force. Attention should be paid to gender and age disparities in the cases analysed and pilots supported. For gender-related issues, the project may engage in collaboration with projects funded under HORIZON-CL6-2022- COMMUNITIES-01-01: Boosting women-led innovation in farming and rural areas.

Type of action	Research and innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

HORIZON-CL6-2022-COMMUNITIES-01-03: Integration of marine ecosystem service valuation, conservation and restoration in socio-economic models

Expected outcome

In line with the European Green Deal, the successful proposal will contribute to fostering a sustainable, balanced and inclusive development of coastal areas, thanks to deployment of digital, nature-based, social and community-led innovations, to deliver nature-based and scientifically validated solutions to existing coastal socio-economic and environmental threats. People are empowered to act for change through upgraded skills and innovative governance that favours an integrated and interlinked territorial development. Coastal communities are better prepared to achieve climate neutrality by 2050, adapt to climate change, and turn digital and ecological transitions into increased resilience to various types of shocks, good health and positive long-term prospects, including jobs, for all including women, young people and vulnerable groups. Tourism, recreational and leisure activity development in coastal areas respects long-term environmental carrying capacity, and social goals. Projects results are expected to contribute to all the following expected outcomes:

- Nature-based and community-led socio-economic development in the coastal sector, revitalising social capacities in fragile communities and supporting environmental improvements, based on integrated marine ecosystem service valuation, management, conservation and restoration.
- Lasting cooperation between local communities and coastal sectors and authorities through enhanced governance and social innovation in different regional contexts.
- Properly assessed and transdisciplinary scientifically validated, supported and monitored social innovation experiments related to coastal climate adaptation and mitigation, biodiversity, water quality, pollution, seafood production, ecotourism etc.
- Innovative socio-economic models resulting from the projects, based on a long-term perspective using a participatory process of visioning and experimentation, are implemented in integrated coastal zone management.
- Improved employment prospects through job creation, development and training of knowledgeable regional/local ambassadors for natural habitat restoration and transformation.
- Scientifically validated recommendations for tourism development in coastal areas reflecting long-term carrying capacity and social goals.
- Nature-based scientifically validated solutions to existing socio-economic and environmental threats, are embedded in new regulations and European Directives like the Maritime Spatial Planning Directive, the Water Framework Directive, the Marine Strategy Framework Directive and the NATURA 2000 Directives.

Scope

Coastal ecosystems play an important role in nutrient recycling/regulation, sediment stabilisation and transfer, food production, reducing risks and impacts of climate change, etc. They are the basis of important socio-economic activities such as tourism and wellbeing, fisheries and aquaculture, housing and transport, trade, renewable energy. Integrated coastal zone management requires more and better integration of ecosystem services' valuation, management, conservation and restoration in socio-economic models through partnerships and collaborations between a range of multi-sector organisations, authorities and coastal communities for a balanced sustainable development and management of potentially vibrant coastal areas.
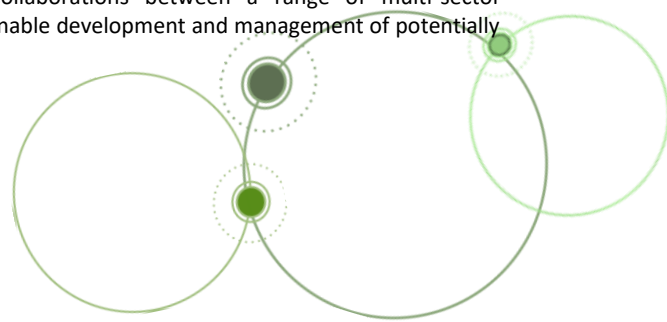
Call – Resilient, inclusive, healthy and green rural, coastal and urban communities

The multi- and trans-disciplinary proposals should design, scientifically guide and develop nature-based coastal socio-economic models, businesses and marine spatial planning, based on the limits and potential of coastal ecosystem services. These scientific activities should aim to avoid traditional conflicts between human-based activities, reduce urban pressures, protect and restore coastal ecosystems, and support critical ecosystem services in order to ensure good environmental or ecological status, social cohesion and resilience. The proposals should stimulate and benefit from increased nature connectedness of coastal communities; cultural heritage including traditional skills, nature-based social and frugal innovation, active engagement and employments of knowledgeable regional/local ambassadors for natural habitat restoration and transformation, ocean literacy training towards and within companies, digital transformation and collaborative (e)governance improvements. Activities could usefully include innovative business models integrating land-based and sea-based production or service provision with simultaneous benefit for the local economy, local jobs and the environment.

The proposals should cover a representative set of coastal areas or regions across Europe varying according to size and geographical, environmental, socio-economic, institutional and administrative conditions (regional, inter-regional, macro-region, cross-border). Interactive research approaches should be used to engage with relevant stakeholders, local businesses and citizens and elaborate options for cooperation, networking and integrated governance seeking to enhance partnership. Proposals could seek to create long-lasting relationships within and between the case study areas benchmarked by the project in order to generate knowledge exchange to foster synergistic relationships in different coastal areas of Europe. The potential use of instruments provided by the European Structural and Investment Funds for the period 2021-2027 should be explored. Some cooperation activities with projects financed under topic HORIZON-CL6-2021-COMMUNITIES-01-04, Destination 'Biodiversity and ecosystem services' and Green Deal Call topics could be included; as well as with relevant projects from other EU programmes or with relevant EU initiatives and networks.

This topic should involve the effective contribution of SSH disciplines.

Proposals must involve coastal actors and other land and sea-based businesses, and economic and local development bodies to implement the required multi-actor approach (cf eligibility conditions). Engaging with managing authorities of the European Structural and Investment Funds during the project would help increase implementation of the project outcomes and support further uptake. This topic should be linked to the Horizon Europe Missions Ocean, seas and waters and Adaptation to Climate Change including Societal Transformation, the Partnership for a climate neutral, sustainable and productive Blue Economy, the Biodiversity Partnership or other partnerships where relevant. Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake.

Type of action	Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 9.00 million
Topic information	Link
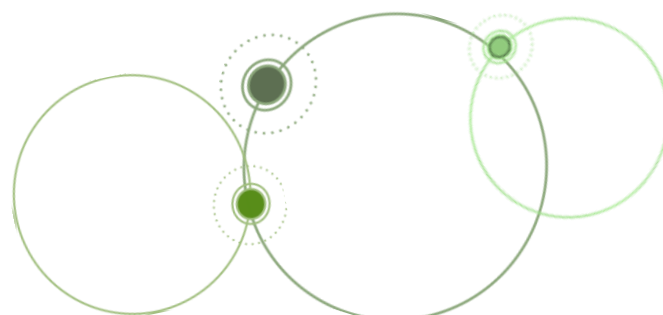
Call – Resilient, inclusive, healthy and green rural, coastal and urban communities

HORIZON-CL6-2022-COMMUNITIES-01-04: Social innovation in food sharing to strengthen urban communities' food resilience

Expected outcome
In line with the European Green Deal priorities and the farm to fork strategy for a fair healthy and environmentally friendly food system, as well as of the EU's Climate ambition for 2030 and 2050, the successful proposal will support the development of policies, business models and market conditions contributing to the sustainable, balanced and inclusive development of urban and peri-urban areas and to the empowerment and resilience of their communities, who can access, afford and choose healthier, nutritious and environmental-friendly food. Projects results are expected to contribute to all following expected outcomes:

- The concept of urban food-sharing economy and of its impacts on the society, the planet and the economy at urban and peri-urban level are better understood, as well as the drivers to its development and the implementation gaps;
- Urban and peri-urban communities develop or strengthen their food-sharing economies as a step towards more innovative, inclusive, sustainable and resilient local food systems and supply chains that can also address emerging problems, such as the challenges posed by the measures to contain the Covid-19 pandemic;
- Prevention and reduction of food waste.

Scope
With the recent Covid-19 pandemic, it is now evident that the risk of disruptions of food systems needs to be given greater attention. Strengthening the resilience of communities (in particular the most vulnerable and isolated, and those at risk of food poverty) to potential food system disruptions is at the heart of this topic. The Pandemic has contributed to the emergence of territorialised and community-based food economies spontaneously created by citizens. These new sharing and circular economies are based on the redistribution of value, knowledge-sharing and reciprocal support, and are often supported by local governments. Urban food sharing initiatives have been multiplying across a wide range of diversified cities, far beyond the wealthiest ones, and are often facilitated by new technologies such as apps, websites and social media. Such initiatives develop strategies that support an increase in resilience, social justice and empowerment of vulnerable and marginalised populations. However, urban food sharing is still an unexplored – and debated – field; there is currently no agreed definition and many activities can be considered as part of it (e.g., kitchen spaces, meal sharing, food business incubators, collaborative delivery services, food donation). The lack of political interest, financing and sufficient data, as well as the existence of regulatory barriers and risks (both real and perceived), are holding back the rise of new food systems economies that work for all people and the planet.

The proposals should foster social innovation, with a special focus on building a more widespread and resilient food sharing economy, where different practices can be considered, while working on 5 distinct areas:
- Mapping, tracking and monitoring: building on the work of the EU-funded project 'Sharecity', proposals should investigate the food sharing landscapes of at least 100 EU/Associated Countries cities to understand how food sharing landscapes differ within and across countries; moreover, proposals should develop automated systems to search, collect and – especially – update existing urban and peri-urban initiatives;
- **Cost-benefit analysis: proposals should define appropriate measures and indicators to assess the social, economic and environmental benefits of urban and peri-urban food sharing, including developing new indices to describe the specificity of food sharing economy**. This should include the production of new knowledge on the challenges, implementation gaps and innovative mechanisms to foster for sustainable food sharing in cities, towns and neighbourhoods;
- **Comparative governance analysis: proposals should investigate how different food sharing landscapes evolve and, also through a scenario analysis, how to transform the existing regulatory regimes, governance structures and habits, to promote sustainable food sharing;**
- Strategic planning: proposals should exploit the potential for replicability/scale up of existing food sharing initiatives across the EU and associated countries and bring innovation into urban food systems design to integrate sustainable food sharing and build the urban food systems of the future;
- **Challenging the existing theories: proposals should study the relationship between the evolution of social norms, culture and local conditions, including their change due to the global pandemics, and the rise of food sharing initiatives.**

Furthermore, proposals should support the definition of innovative local strategies to overcome the barriers to food and nutrition security in urban areas and boost community resilience. This can include the creation and evaluation of distributive food systems (e.g. mutual aid programmes, local food systems networks) based on local needs and capacities, where value, knowledge and power would be redistributed fairly across actors and territories; tailored solutions - including social innovations, frugal innovation, technologies, new/adapted business models -, as well as new market places. **Proposals should address inequalities in urban food systems, whether they be due to gender, race and other social categories.**
Proposals should implement the multi-actor approach by conducting inter and trans-disciplinary research and involving a wide diversity of food system actors, with a special attention to consumers and civil society organisations. They should ensure

a strong involvement of citizens and civil society, as well as of academia, industry and public authorities in the development of the methods and approaches to innovation. Proposals should explain and map how the co-benefits relevant to the four Food 2030 priorities will be achieved: Nutrition for sustainable healthy diets, Climate and environment, Circularity and resource efficiency, Innovation and empowerment of communities.

Proposals should set out a clear plan on how they will collaborate with other proposals selected under this and any other relevant topic/call, e. g. by participating in joint activities, workshops, as well as common communication and dissemination activities.

This topic should involve the effective contribution of SSH disciplines.

Type of action	Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 10.00 million
Topic information	Link

HORIZON-CL6-2022-COMMUNITIES-01-05: Assessing the socio-politics of nature-based solutions for more inclusive and resilient communities

Expected outcome

A successful proposal will contribute to the EU's goal of leading just digital, economic and ecological transitions that will leave no one behind, supporting in particular European Green Deal priorities such as the biodiversity strategy for 2030. R&I will contribute to develop rural, coastal and urban areas in a sustainable, balanced and inclusive manner thanks to the deployment of nature-based solutions (NBS) and to a better understanding of the environmental, socio-economic, behavioural and cultural drivers of change. R&I will also further support the empowerment of communities to deploy NBS to adapt to climate change and turn digital and ecological transitions into increased resilience, well-being and positive long-term prospects, such as jobs for all (including for women, young people and vulnerable groups). Project results are expected to contribute to all of the following expected outcomes:

- Enhanced contribution of nature-based solutions (NBS) to social and economic targets, especially in vulnerable communities and notably regarding the transformative change needed to address the biodiversity and climate crises.
- New NBS governance models and co-creation approaches and tools, as well as NBS design and technologies that enhance social benefits while providing ecological and economic benefits.
- NBS are better suited to respond to different socio-political contexts and have higher replicability in the diverse environmental, economic and social conditions across Europe.

Scope

Nature-based solutions (NBS) are already being delivered with increasing evidence on their effectiveness, but implementation issues persist, hindering NBS uptake and upscale. **There is a need to move beyond seeing the implementation challenge as primarily a technical issue, to develop our understanding of the economic, social, political, moral and cultural dimensions of designing and implementing NBS.** Most of the available approaches seem inadequate to fully take into consideration synergies and trade-offs among different actions, notably in what concerns the social and cultural benefits of NBS. They often also fail to understand the social, political and institutional contexts and the material and discursive elements that shape NBS implementation. This, in turn, affects the long-term success of NBS, notably in contributing to the transformative change needed to address the biodiversity and climate crises. This understanding is particularly crucial when implementing NBS to support vulnerable communities and regions to cope with transformative change in old-industrialised, low-income, outermost or disaster-hit areas. NBS can also contribute to addressing inequities and well-being in communities and regions who need it most, especially in terms of the post-COVID19 recovery. Additionally, our understanding of how diverse actors – who may operate at different scales and through multiple networks – are engaged in the development and implementation of NBS is still limited, especially when the deployment of NBS implies collaboration across different regions, administrative areas or simply different types of land owners.

The successful proposals should:

- Gain a wider understanding of the role of actors involved in NBS, considering: a) particular groups of actors that have been under-researched (e.g. land holders such as churches, charitable organizations, educational establishments, utilities, etc.); b) sectors of the economy (e.g. agriculture, forestry, tourism, finance, etc.) and c) landscapes (e.g. coastal areas, river catchments, wetlands, etc.);
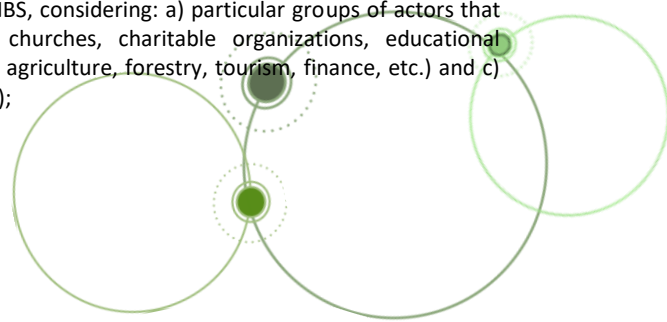
- Investigate how different NBS designs and governance can contribute to environmental justice, prevent environmental racism and gentrification, insure the inclusion and active participation of women, youth, minority groups, immigrant communities, etc.;
- Develop innovative governance models: a) exploring different forms of engagement, inclusion and stewardship; b) enabling the breaking of silos in public administration and between different administrative domains; and c) tackling other legal, management and administrative issues;
- Propose ways in which NBS governance and design can contribute to transformative change and to a just transition in support of the Sustainable Development Goals;
- Understand and propose solutions to functional conflicts in land-use for better and more integration between NBS, land-use planning and other (possibly conflicting) sectors, their policies and planning processes;
- Explore governance techniques (e.g. standards, certification, incentives, subsidies, etc.) that develop private and voluntary governance alongside formal regulatory and planning powers, with a view to mainstreaming NBS in the public and private sectors.
- Identify the possibilities for, and limits to, the full co-creation approach in NBS (including co-design, co-implementation, co-maintenance and co-monitoring), their underlying governance arrangements and instruments;
- Provide approaches based on citizen science, big data or artificial intelligence tools to better communicate the science of NBS and promote citizen engagement in the co-creation, co-implementation and co-monitoring of NBS;
- Understand how the meanings and values attached to nature in urban, rural, coastal, periurban or post-industrial areas affect the long-term success of NBS. To this end, investigate what counts as nature, what is valued and why this varies amongst individuals and communities as well as how this can be taken into account in the development of NBS.
- Investigate the impact of citizens' perceptions and expectations towards NBS on management decisions and delivery of ecosystem services, while considering also the role of NBSs in generating new kinds of connections and values for nature and with what consequences.

Proposals should address all of the above points.

Proposals should bring together from the start multiple types of scientific expertise in both natural sciences and social sciences and humanities (e.g. geography, sociology, political ecology, behavioural sciences, anthropology, philosophy, etc). In particular, this topic should involve the effective contribution of SSH disciplines. Projects should seek to contribute to the New European Bauhaus initiative by supporting the green and digital transitions in communities' living environments through merging sustainability, inclusiveness and quality of experience. Small-scale pilots could be envisaged to explore NBS which are innovative either in their functional scope, socio-economic reach, integrative approaches or application in new settings.

Applicants should create synergies with projects under the same topic and other relevant ongoing or up-coming projects, notably the Horizon 2020 NBS project portfolio and its task forces; HORIZON-CL6-2021-BIODIV-01-05: The economics of nature-based solutions: cost-benefit analysis, market development and funding; HORIZON-CL6-2021-BIODIV-01-06: Nature-based solutions, prevention and reduction of risks and the insurance sector; HORIZON-CL6-2022-BIODIV-01-03: Network for nature: multi-stakeholder dialogue platform to promote nature-based solutions; HORIZON-CL6-2022-COMMUNITIES-02-02-two-stage: Developing nature-based therapy for health and well-being; HORIZON-CL6- 2021-COMMUNITIES-01-06: Inside and outside: educational innovation with nature-based solutions. To this end, proposals should include dedicated tasks and appropriate resources for coordination measures, foresee joint activities and joint deliverables. Proposals should ensure that all evidence, information and project outputs will be accessible through the Oppla portal (the EU repository for NBS). **Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake**. In order to achieve the expected outcomes, international cooperation is strongly encouraged, in particular with the Latin American and Caribbean region and the USA.

Type of action	Research and Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 06.00 million
Topic information	Link
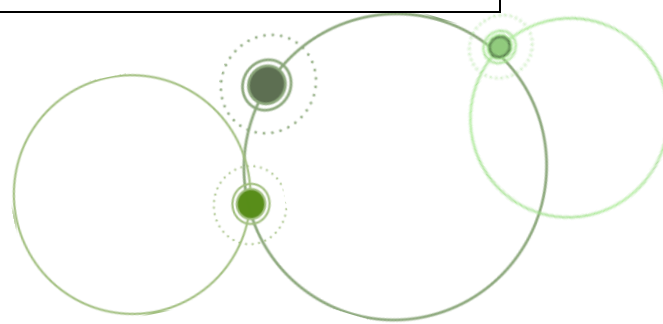
Call – Resilient, inclusive, healthy and green rural, coastal and urban communities

HORIZON-CL6-2022-COMMUNITIES-02-01-two-stage: Smart solutions for smart rural communities: empowering rural communities and smart villages to innovate for societal change

Expected outcome

The successful proposal will contribute to fostering a sustainable, balanced and inclusive development of rural areas, supporting the implementation of the European Green Deal, in particular its fair and just transition component, the European digital strategy, the European pillar of social rights and the EU long-term vision for rural areas. It will do so by supporting digital, social and community-led innovations and by equipping rural communities with innovative and smarter solutions that increase access to services, opportunities and adequate innovation ecosystems, including for women, youth and the most vulnerable groups, improve attractiveness and reduce the feeling of being left behind, even in the most remote locations like mountains. The increased availability of smart solutions and support to community-led innovations will empower people to act for change and get prepared to achieve climate neutrality by 2050, adapt to climate change, and turn digital and ecological transitions into increased resilience, good health and positive long-term prospects, including jobs, for all including women, young people and vulnerable groups. Project results are expected to contribute to all of the following expected outcomes:

- Enhanced capacity of rural communities and rural people to innovate for change thanks to the specific outcomes below;
- Enlarged set of smart solutions for rural communities (practical and transferable innovative solutions to challenges faced by rural communities in a variety of fields e.g. social services, health, energy, mobility, climate adaptation and mitigation, biodiversity and ecosystem management, education, access to culture, etc.).
- Upgraded approaches, methods, tools and skills to design, implement, monitor and evaluate community-led innovations contributing to the implementation of smart village strategies and social innovation initiatives improving i) rural people's well-being, ii) rural community resilience to shocks, iii) rural contributions to the United Nations Sustainable Development Goals and to the EU long-term vision for rural areas.
- Strengthened human capital, including networks, enhanced relations and knowledge exchange between smart villages and rural community innovators on transferable innovations and innovation processes.

Scope

Proposals should start from past work conducted in the framework of i) EU action on smart villages, including the related preparatory actions; and ii) Horizon 2020 projects dedicated to social innovation in rural areas. Proposals should support a large number of rural community-led, social innovation or smart village pilot initiatives in a set of locations in the EU and Associated Countries representative of the diversity of social and geographical contexts. They should prototype, test, pilot and demonstrate innovations that answer the most pressing rural challenges found at these locations, with particular attention to social and environmental challenges.

Proposals should explore various forms of innovations: technical, technological, business, organisational and social. Social innovation is recommended when the solution is at the interface between social and technical solutions and requires social change, new social practices, social ownership or market uptake. Proposals should exploit in particular the potential of digital technologies to answer rural communities' challenges, respecting the principles of the declarations on "joining forces to boost sustainable digital transformation in cities and communities" and on "a smart and sustainable digital future for European agriculture and rural areas". Proposals should build on the work of projects funded under the topic DT-ICT-09-2020 and avoid duplications. Criteria for selecting the pilot initiatives supported should include the contribution to rural people's well-being, rural community resilience to shocks, Sustainable Development Goals and the EU's long-term vision for rural areas as well as the potential transferability or replicability of the innovations to other European villages facing similar conditions. The experience gained from supporting these community-led innovation pilot initiatives should lead proposals to formulate upgraded approaches, methods and tools that should be widely disseminated in close coordination with the 'expertise and training centre on rural innovation funded under HORIZON-CL6-2021-COMMUNITIES-01-02.

Proposals should also capitalise on i) rural innovation processes and knowledge and innovation systems or ecosystems needed to support rural community-led or social innovation and smart villages; and ii) lessons learnt to improve policies and governance frameworks, especially on instruments supporting the development of social capital, social networks, social economy and social innovation and with attention to various needs of various target groups.

Proposals must implement the multi-actor approach, bringing together scientists alongside rural community organisations, action groups or networks with a demonstrated ability to connect to a large number of local communities and disseminate and exploit project results. **The consortium should bring together a multiplicity of competences and science disciplines with an effective contribution of SSH disciplines, to ensure a skilled accompaniment of a wide range of innovation areas likely to come from the pilot initiatives (climate mitigation and adaptation, social care and services, energy, mobility, culture, education etc.) and innovation approaches and technologies (technical, organisational, social, digital…).** It should demonstrate substantial prior experience in facilitating community-led bottom-up innovation initiatives.
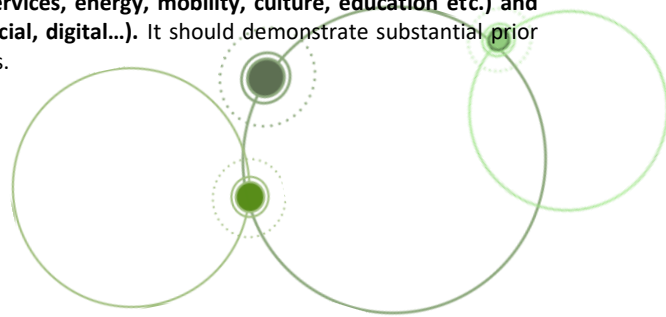
Call – Resilient, inclusive, healthy and green rural, coastal and urban communities

As an option, proposals may provide financial support to third parties, particularly for SMEs or entities who would develop specific innovative solutions needed in the pilot initiatives. Consortia who decide to use this option should define the selection process of entities for which financial support will be granted. Proposals should include a task to cooperate with other projects funded under this topic, other relevant innovation projects and with the 'expertise and training centre on rural innovation' funded under HORIZON-CL6-2021-COMMUNITIES-01-02 from the beginning of the project (taking up tools and training kits) until its end (dissemination of upgraded tools and smart solutions) and with the projects funded under HORIZON-CL6-2022-COMMUNITIES-01-01 for issues related to women-led innovation. Proposals should also foresee close coordination with the common agricultural policy networks to maximise the contribution of project activities to the achievement of future common agricultural policy (2021-2027) objectives, in particular in relation with smart villages. Finally, proposals are encouraged to liaise with the relevant European Institute of Technology knowledge and innovation communities.

Type of action	Research and Innovation Action
Deadline	1st Stage - **15 February 2022** 2nd Stage - **06 September 2022**
Expected EU contribution per project	EUR 7.00 million
Topic information	Link

HORIZON-CL6-2022-COMMUNITIES-02-02-two-stage: Developing nature-based therapy for health and well-being

Expected Outcome

A successful proposal will contribute to the EU's goal of leading just, digital, economic and ecological transitions that will leave no one behind, supporting in particular European Green Deal priorities such as the biodiversity strategy for 2030. R&I will support the development of nature-based therapy to help communities turn the ecological transition into opportunities for good health and well-being, increased resilience, and positive long-term prospects such as the creation of green jobs. Project results are expected to contribute to all following expected outcomes:

- Sharper view of green space management, nature protection, agriculture and forestry sectors as care providers and their possible linkages with the healthcare, social and educational sectors;
- Stronger evidence base for the causal relationships between nature and health and well-being for more effective nature therapy prescriptions;
- Cost-effective nature therapy prescriptions are more widely used in the health care sector;
- Greater citizen and policy-maker awareness of the positive benefits of nature for health and well-being;
- Wider utilization by healthcare professionals and citizens of nature therapy as a form of preventive medicine.

Scope

Nature affects human health in different ways. In particular, urban environments can have a negative impact on physical and mental health. This is due to urban stressors such as increased noise levels, higher crime rates and higher levels of pollution. The total global burden of disease attributable to mental illness has recently been estimated to be as high as 32% of total years lived with disability and 13% of disability-adjusted life-years, on par with cardiovascular and circulatory diseases. It is important, therefore, to determine the degree to which nature experience might lessen and address this burden. Even more so in view of the fact that the opportunities and time spent in nature are decreasing. However, despite many putative positive correlations identified between nature and health and well-being, the causal understanding of relationships between health and nature exposure are not well understood. The long-term effects are also less well studied and recognised in policies. Social, economic and cultural factors strongly mediate the strength and direction of linkages between health and nature. Age, gender and especially socio-economic status may modify the association between greenness and health behaviours and outcomes and need to be better understood to create more effective nature therapy. Additionally, mental health benefits may vary with the type of interaction with nature and the form of sensory input. Furthermore, the health and well-being benefits of exposure to nature are affected by cultural perspectives and experiences relating to social interaction and contact with the natural environment.

A successful proposal should:

- Develop a common framework to increasingly recognise and promote contact with nature, including protected areas and other green and blue spaces, as a cost-effective response for the prevention and treatment of human health and well-being;
- Propose an interdisciplinary and cross-sectoral approach, including the involvement of the health care sector, land owners, as well as green space management and nature protection sectors;
- Improve schemes monitoring nature-health linkages to enhance the evidence base and tools for the health care sector, green space management, nature protection, urban planning and landscape architecture;
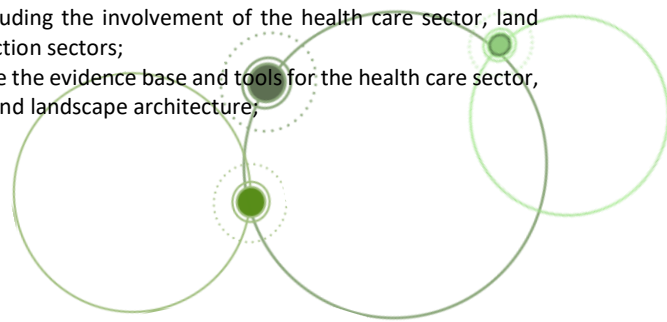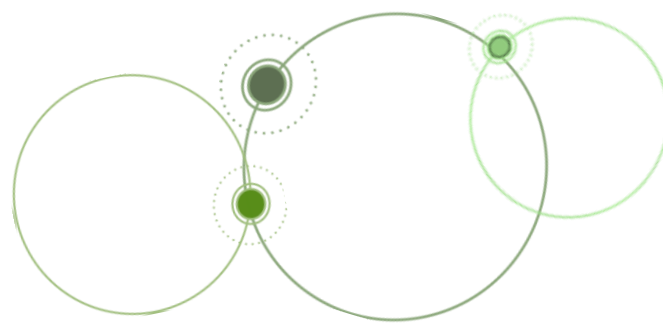
- Develop longitudinal prospective methods, (quasi-) experiments or well-controlled interventions, to provide more evidence of the causal relationships between nature and health and well-being:
  - o **Understanding of when people explicitly choose to go to an urban green space and what experiences they have there (e.g., active versus passive activities).**
  - o Determining the type of interactions and dose of interactions necessary for long-term health and well-being benefits.
  - o **Understanding the mediators of the health-nature relationship, such as age, gender, socio-economic status or culture.**
  - o Considering the difference between greenness quantity and quality and determining which aspects of natural features are relevant to mental health.
  - o Understanding how different geographical locations and factors such as population density affect the health-nature relationships;
- Test nature therapy sessions, identify best-practices and develop the necessary tools and guidelines for integration of nature-based care in the public health sector;
- **Identify legal and administrative arrangements, partnerships, and financial mechanisms for implementation of nature therapy sessions.**

The proposals should address all of the above points.

Proposals should bring together from the start multiple types of scientific expertise in both health and natural sciences, as well as social sciences and humanities, together with a variety of community and health sector representatives, businesses, civil society organisations and citizens. Proposals should ensure that all evidence, information and project outputs will be accessible through the Oppla portal (the EU repository for nature-based solutions). Applicants should create synergies with projects under the same topic and other relevant ongoing or up-coming projects, notably the Horizon 2020 NBS project portfolio and its task forces; HORIZON-CL6-2021-BIODIV-01-05: The economics of nature-based solutions: cost-benefit analysis, market development and funding; HORIZON-CL6-2022-BIODIV-01-03: Network for nature: multi-stakeholder dialogue platform to promote nature-based solutions; HORIZON-CL6-2022-COMMUNITIES-01-05: Assessing the socio-politics of nature-based solutions for more inclusive and resilient communities; HORIZON-CL6-2021- COMMUNITIES-01-06: Inside and outside: educational innovation with nature-based solutions. To this end, proposals should include dedicated tasks and appropriate resources for coordination measures, foresee joint activities and joint deliverables.

Social innovation is recommended when the solution is at the socio-technical interface and requires social change, new social practices, social ownership or market uptake. In order to achieve the expected outcomes, international cooperation is strongly encouraged, in particular with the USA, Japan and the LAC region. **This topic should involve the effective contribution of SSH disciplines.**

Type of action	Research and Innovation Action
Deadline	1st Stage - **15 February 2022** 2nd Stage - **06 September 2022**
Expected EU contribution per project	EUR 6.00 million
Topic information	Link

Call – Innovative governance, environmental observations and digital solutions in support of the Green Deal

HORIZON-CL6-2022-GOVERNANCE-01-01: Mobilisation of society to transform food systems for co-benefits

Expected outcome

In line with the European Green Deal priorities and the farm to fork strategy for a fair healthy and environmentally friendly food system, as well as with the EU's Climate ambition for 2030 and 2050, the successful proposal will involve the mobilisation of society to transform food systems for co-benefits. This will lead to innovative governance models enabling sustainability and resilience, which achieve better-informed decision-making processes, societal engagement, and innovative solutions. With the overarching aim to help transform food systems for co-benefits to nutrition and health, climate, environment, biodiversity, circularity and communities, the project will:

- Build on the Fit4Food2030 initiative to further the mobilisation of all relevant Food System public and private sector stakeholders, researchers, non-governmental organisations, educators, knowledge brokers, media and society, to work together via an interlinked structure at the level of cities, regions, and countries across Europe, and that supports mutual learning and good practices.
- A new and improved structured network of evidence-based policy labs throughout Europe so as to raise awareness, foster joint action, good practices and knowledge sharing amongst stakeholders relevant to food system policy developments and implementation at various levels: local, regional, national, EU and international level. Key to this will be the inclusion of decision and policy makers, scientists, and public authorities to ensure the sustainability and legitimacy of the governance process.
- Increased pan-European citizen engagement, social innovation and co-creation through local or regional living labs; promote food systems science education for children and youth while respecting national competence in the area of education and health, and measure the food systems transition progress in society.
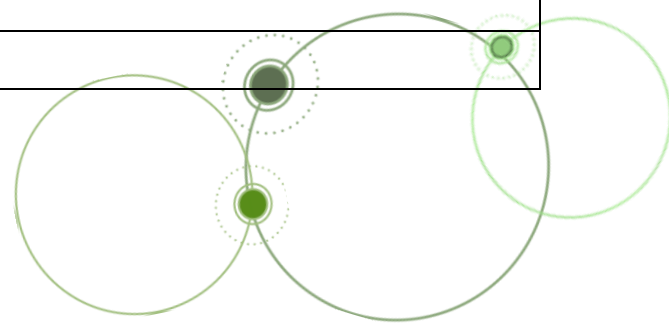
Scope

Successful proposals are expected to:

- Establish a pan-European Food 2030 multi-actor and public engagement mechanism to raise food system awareness and foster more citizen (including youth) involvement and interest in science, research and innovation, necessary to foster support for a food system transformation that delivers co-benefits.
- Engage a network of science museums to co-create and deploy a Food 2030 "food systems lab" inspired by the Oceans Plastic Lab to be deployed across Europe linking in particular to EU presidencies, important global meetings (e.g.: COP), and other relevant place-based initiatives (like I-Capital, Green Capital, etc.).
- Support emerging relevant citizen science projects at local level (neighbourhoods, towns and cities), conduct hackathons, hold science cafés, and set up a dedicated video channel to display food systems success stories, all with the aim of raising awareness of the need to transform food systems and to co-create citizen-inspired solutions.
- Develop and deploy innovative interactive food systems education material in support of both the informal and formal education of children and youth (including gender-specific messaging) across Europe while respecting national competence in the area of education and health, in cooperation with relevant European school networks, associations and local media outlets.
- Facilitate the cooperation of relevant EU Horizon Europe projects to arrive at a common language and explore/set common goals, discuss potential farm to fork strategy and Green Deal interventions, all with a view to strengthen co-ownership and cooperation, share and communicate knowledge, boost innovation and increase take-up of improved policy schemes among the food system actors, and society.
- Measurement of food systems transition progress by, for example, conducting surveys or employing sentiment analyses that demonstrates society's level of interest and willingness to transform food systems for co-benefits and the perceive trade-offs.
- Explain and map how co-benefits will be achieved relevant to the four Food 2030 priorities475: nutrition for sustainable healthy diets, climate and environment, circularity and resource efficiency, innovation and empowerment of communities.

Involving a wide diversity of food system actors and conducting inter-disciplinary research is expected to implement the required multi actor approach (cf eligibility conditions). The project should set out a clear plan on how it will collaborate with other projects selected under this and any other relevant topic/call, by participating in joint activities, workshops, as well as common communication and dissemination activities.

This topic should involve the effective contribution of SSH disciplines.

Type of action	Coordination and Support Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 8.00 million
Topic information	Link

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Call – Innovative governance, environmental observations and digital solutions in support of the Green Deal

HORIZON-CL6-2022-GOVERNANCE-01-03: Multi-layer governance performance of marine policies

Expected Outcome

The successful proposal(s) will enhance new knowledge and design or improve tools to achieve better informed decision-making processes, social engagement and innovation, supporting the implementation of the European Green Deal. Proposals will contribute to the development or improvement of innovative multi-layer governance models enabling sustainability and resilience and of EU and international science-policy interfaces. Project results are expected to contribute to all the following expected outcomes:

- Better understanding by the policy making community of the institutional barriers such as lock-ins, path dependency, bounded rationality, political inertia and power imbalances in the formulation and implementation of marine policies.
- The policy making community exploited analyses and better understanding of formal and informal policy governance work streams or processes, including public consultation and encompassing local, regional, national, European and global ocean governance aspects.
- Stronger e-government and easily achievable open government data facilitate greater access to public services.
- Appropriate communication, exchange, coordination and management is enabled at regional, national and European level.
- Improved collaborative governance performance allowing social and technical innovations to provide opportunities for the social contract between the State and the citizenry through increased transparency, enabling better spatial planning and natural resource management, ultimately leading to increased trust in policy making.

Scope

The management of the ocean, seas and coasts is largely carried out in a fragmented manner, at institutional as well as legal governance level and through several related sectors. Poor coordination between sectoral approaches, low institutional capacity, weak implementation of international conventions and lack of technical knowledge and of financial resources for regional, cross-regional and national processes are common issues in Member States and partner countries, affecting coastal communities severely in terms of food security and livelihoods (loss of jobs). Current policy governance models and work streams, including public consultation, at different governance levels, need to be analysed in relation to their performance and further challenged to intensify regional and local integration in the policy dialogue, as the (total, regional and local) transitions towards a sufficiently protected marine natural capital and health and wellbeing of citizens should also be just and inclusive. Proposals should address the need to meet increasing public demands and to address declining public trust.

Proposals should conceptualise and operationalise strategies to address identified barriers to collaborative governance related to the ocean and seas based on a long-term perspective using a participatory process of visioning and experimentation, accompanied by strong and justified recommendations on the required capacity building. Proposals should improve or develop and leverage innovative digital tools, towards a stronger e-government and easily achievable open government data.

The proposals should cover comparisons within, across and between different spatial governance layers (local, regional, inter-regional, macro-regional, cross-border, international) to cover a representative set of governance structures across Europe varying according to size and geographical, environmental, socio-economic, institutional and administrative conditions.

This topic should involve the effective contribution of SSH disciplines.

Interactive research approaches should be used to engage with local, regional, national and international authorities, as well as local communities, citizens and other relevant stakeholders, considering gender, age and socio-economic background, where relevant. Projects should build on existing knowledge and integrate results from multiple origins, including other EU, international (for example UN) or national projects or studies. Some cooperation activities with projects financed under topic HORIZON-CL6-2021- GOVERNANCE-01-06 on environmental and social cross-compliance of marine policies could be included. This topic should also be linked to the Horizon Europe Mission Ocean, seas and waters and the Partnership for a climate neutral, sustainable and productive Blue Economy or other partnerships where relevant.

Type of action	Research and Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 6.00 million
Topic information	Link
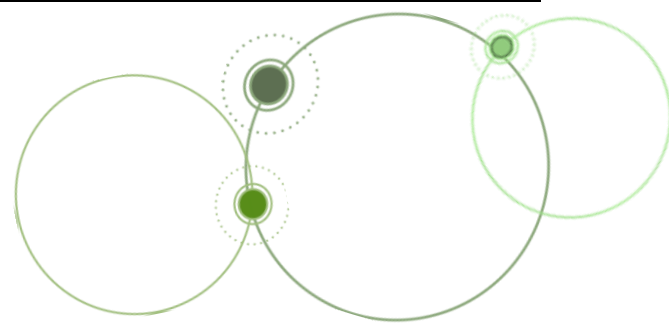
Call – Innovative governance, environmental observations and digital solutions in support of the Green Deal

HORIZON-CL6-2022-GOVERNANCE-01-04: Consumer-focused labelling options for bio-based products

Expected outcome

The successful proposal will support the deployment of business-to-consumers communication by producers and traders of bio-based products to enable responsible production and consumption in line with the objectives of the European Green Deal, the EU bioeconomy strategy and the European Climate Pact. Project outcomes will contribute to improve the sustainability performance and competitiveness in the bio-based systems and to the establishment of the innovative governance models notably to achieve better-informed decision-making processes, social engagement and innovation. Project results are expected to contribute to all of the following expected outcomes:

- Transparency of bio-based products and information to consumers and public authorities are provided through effective and robust business-to-consumers labelling on product traceability, quality, carbon footprint, biodiversity impacts and other environmental footprints.
- Consumers, industry and public bodies are enabled to switch towards socially and environmentally responsible behaviour within their choices in a transparent and inclusive way.
- Improved understanding of metrics on value generated per unit of biological resources.

Scope

The project is expected to advance the role and impact of bio-based innovation to accelerate the transition from a linear fossil-based economy, which leads to overuse and depletion of natural resources, into resource-efficient and circular bio-based systems operating within safe planetary boundaries. Improved and informed governance and social innovation contribute to reducing resource consumption and result in an increased innovation capacity of all actors. Informed consumers may pursue the objectives of circular economy, asking for efficiency and inclusiveness of services provided through less resources and goods, changing consumption patterns (e.g. reducing meat consumption), preventing food waste and separating bio-waste from other waste streams so that it can be (partly) converted to bio-based materials.

Proposals will focus on consumer-oriented labelling options for industrial bio-based products with low environmental footprint, in terms of resources, processes and materials used. Industrial bio-based products do not include food/feed, biofuels, bioenergy and cultural/recreation sectors. However, relevant initiatives in the field of consumer-focussed labelling of sustainability of bio-based products, arising from EU policies in the bioeconomy sectors, should be taken into account. Proposals should:

a. Select a range of bio-based systems where value chains can be monitored in their environmental and social impacts (benefits and trade-offs) from the primary materials trade to the final products.
b. Develop pre- and co-normative research to design or update standards and labels for business-to-consumers communication of climate-neutrality and environmental impacts/benefits/trade-offs and performances of materials and products. Environmental impacts should include carbon footprint, climate neutrality, biodiversity impacts and any other environmental footprint relevant for the specific bio-based value chain and final products. Metrics on value generated, in the final product, per unit of biological feedstock used, including bio-waste, will be assessed.
c. Develop guidelines on the design of labels for bio- based products that include the perspectives of public authorities (national, regional, local) and consumers.
d. Assess existing/develop new monitoring system and indicators of effectiveness and robustness of existing business-to-consumers labels and certification schemes.
e. Demonstrate/test effectiveness of existing (voluntary) business-to-consumers labels and certification schemes and monitor robustness. This action includes the identification of labels and certification schemes and testing of the monitoring system and indicators assessed/developed.
f. Assess costs and benefits from the adoption of business-to-consumers labels and certification schemes in selected bio-based systems.
g. Assess and develop smart options for the consumers in the digital age (e.g. mobile applications) aiming at sound understanding and practical use in support of and complying with the current relevant legal framework.
h. **Analyse social measures to enable consumers to switch towards socially and environmentally responsible behaviour within their choices (e.g. regulatory measures, corporate responsibility initiatives, education), ensuring inclusiveness of all actors (NGOs, civil society etc) and taking into account differences between gender, age and socio-economic background.**

The proposals should seek complementarities with related actions on bio-based innovation and market measures, e.g. synergies with the food systems if appropriate or any other sector, and ensure inclusiveness and engagement of all actors along bio-based value chains.

This topic should involve the effective contribution of SSH disciplines.
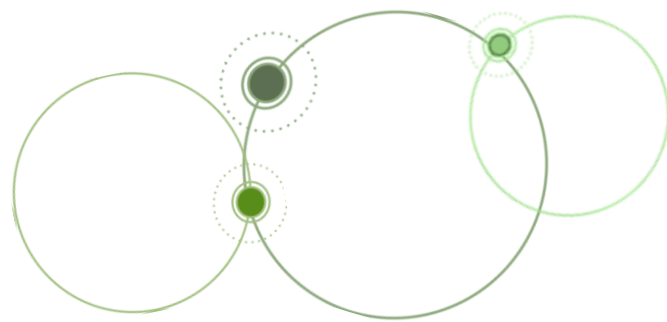
Call – Innovative governance, environmental observations and digital solutions in support of the Green Deal

Type of action	Coordination and Support Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 3.00 million
Topic information	Link

HORIZON-CL6-2022-GOVERNANCE-01-06: Water governance, economic and financial sustainability of water systems

Expected Outcome

In support of the European Green Deal and EU water-related policies, successful proposals will contribute to innovative governance and sound decision making in water policy, in particular Destination 'Innovative governance, environmental observations and digital solutions in support of the Green Deal's impact "Innovative governance models enabling sustainability and resilience notably to achieve better informed decision-making processes, social engagement and innovation". Projects results are expected to contribute to all of the following expected outcomes:

- Improve policy implementation for securing sustainable water use across sectors, while insuring transparency and inclusiveness
- Promote a better integrated planning approach across water-using sectors
- Help to link water management to the economic and social development sectors.
- Support coordination between water policies and other relevant policies and coordination of planning measures across relevant EU and national instruments for sustainable water use
- Empower citizens by increasing their motivation and capacity to influence effective water governance decisions.
- Help society to implement through governance, the technological, economic, political, and social measures that will set a course toward the achievement of a desirable, more sustainable and secure water future.
- Support the implementation of the European Green Deal and the Sustainable Development Goals, notably SDG 6 "Ensure availability and sustainable management of water and sanitation for all"

Scope

Changing the way water is used, managed and shared with people, our environment and our economy, addressing trade-offs and ensuring policy coherence, and helping shape the appropriate institutional environment to deal with the complexity of multiple water challenges and the design of the water systems of the future, requires effective development and implementation of sound water management and governance strategies. The governance and institutional set up must be designed to respect the needs of the natural aquatic environment in terms of water quantity (water allocation) and quality, reconcile the competing demands of the economy over water resources and drive the transition in water using sectors towards operation within the sustainability limits. Water problems are commonly the results of governance problems. Technical solutions often exist, but clarity is often lacking as to who does what, at which level and how. Implementing appropriate governance schemes or designing new multi-level governance and institutional settings for the implementation of sound water management, will help to achieve sustainable use of natural resources, as well as prevent pollution and protect biodiversity.

This topic aims to validate innovative multi-level water governance practices among various stakeholders to strengthen policy integration, coherence and coordination and assess their impacts on economy, social well-being and environment. Actions should assess current governance approaches and organisational models in different river basins to optimise water governance and integrate it with other sectors, such as energy, agriculture, land use and urbanisation, and to overcome fragmentation in public policy formulation and decision-making. They should also aim to understand how different operational governance contexts at various levels, influence the effective realisation of sustainable water management in practice and explore the interaction among governance approaches at different spatial and temporal scales with a view to understanding potential conflicts and strengthening synergies.

Research should also address ways to value water and develop appropriate tariffs and pricing policies to ensure both access to water and sufficient funds for systematic renewal of water service infrastructure, as well as ecosystems restoration. Innovative mechanisms should be developed to promote stakeholder engagement and involvement of public participation in defining and developing methods for collaborative approaches, as well as to promote social innovation, effective communication platforms, encourage exchange of know-how, expertise, eliminate frustration, minimize risks of distortion, and increase citizens' responsibility.

The role of appropriate economic policy instruments, financing and business models (investments, risk management, water pricing, cost-benefits…) in governance towards ensuring long term financial sustainability and increasing investments in the water sector, should be also assessed. Actions to effectively implement appropriate governance approaches in practice, taking into consideration research insights, and to support the implementation of relevant governance indicators, such as, those developed by OECD, including the assessment of their performance, should be also supported.
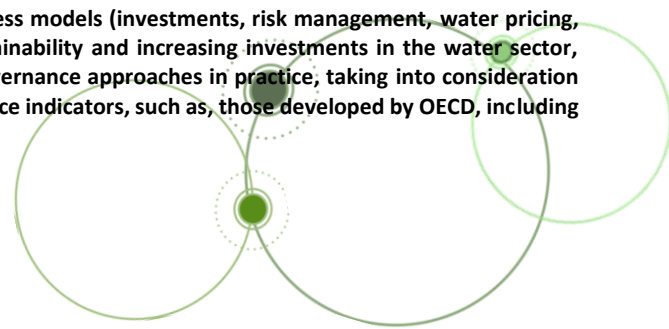
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Call – Innovative governance, environmental observations and digital solutions in support of the Green Deal

In general, the participation of academia, research organisations, utilities, industry and regulators is strongly advised, as well as civil society engagement whenever necessary, also aiming to broaden the dissemination and exploitation routes and to better assess the innovation potential of developed solutions and strategies.

This topic should involve the effective contribution of SSH disciplines.

Type of action	Research and Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 3.00 million
Topic information	Link

HORIZON-CL6-2022-GOVERNANCE-01-08: Uptake and validation of citizen observations to complement authoritative measurement within the urban environment and boost related citizen engagement

Expected Outcome

A successful proposal will contribute to the wide deployment of and adding value to environmental observations, by improving the uptake and validation of data collected by citizens and by increasing citizen involvement and engagement, thus contributing to the European Green Deal objectives and a strengthened Global Earth Observation System of Systems (GEOSS). Proposals are expected to contribute to all of the following outcomes:
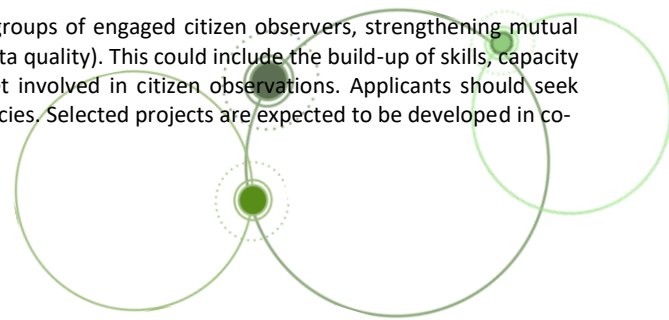
- A more widespread participation of citizens, (e.g. new and/or existing associations/groupings of citizens observers) in the monitoring, observation, and protection of the urban environment, complementary to governmental measures;
- Greater availability of qualitative and quantitative in-situ data for long time series and better geographical coverage, contributing to the in-situ component of existing observation systems (such as Copernicus, European research infrastructures and GEOSS);
- Broader use of data and information collected by citizens in policy and research, with crowdsourcing and citizen observations acknowledged as valuable information complementary to authoritative observations;
- Increased use of existing toolkits and development of new toolboxes (methodologies, methods, technologies) for broad use, which could include the development of efficient passive sampling systems;
- Leveraged use of wearables for citizens and other low-cost technologies in the domain of environmental observation.

Scope

Successful proposals are expected to support citizen engagement, specifically the active role of citizens in the collection and use of data and information within the urban environment to complement the data and information collected through other means of observation (space-based, airborne, etc.). The proposals selected under this topic should increase societal awareness about the urban environment and lead to an increase in actions necessary to protect it. The proposals should contribute to more comprehensive and available data and information of good quality to assess the state of the urban environment in support of the climate transition and the European Green Deal and to the GEO initiatives related to urban environment and urban resilience. The information derived by the selected projects should help in shaping policies targeting the monitoring and greening of the urban environment, in addition to monitoring schemes already set out by public authorities at different levels (regional, national, European, even global). Proposals should pay particular attention to encouraging the validation and uptake of citizen observations for policy and compliance use. The proposals should ensure that the observations/data produced will be available on relevant existing platforms such as GEOSS, European research infrastructures, INSPIRE and EMODNet. The sustainability of the (existing) validation methods should be ensured for a broader use in the future, through the development of toolboxes, containing tested methodologies, methods and technologies.

The social and cultural dimensions of the citizen observation should be given due consideration within the proposals and therefore be looking into possibilities to engage citizens through e.g. social innovative, cultural or art-related initiatives. This should be in the context of further engaging and raising the interest and awareness of all citizens in observing their environments, but also in looking into the possibilities for co-creation of solutions for the urban environment. Particular attention should be paid to engaging women and marginalised groups, such as ethnic minorities and disabled persons, in co-creation efforts.

Particular attention should be directed to cooperation between different groups of engaged citizen observers, strengthening mutual learning and the exchange of good practices (in particular with respect to data quality). This could include the build-up of skills, capacity and networking possibilities between citizen associations to help them get involved in citizen observations. Applicants should seek cooperation with local, regional, national and European environmental agencies. Selected projects are expected to be developed in co-

creation and to build upon the results of the WeObserve project, as well as demonstrating measures to communicate and cooperate with other relevant citizen science projects funded under Horizon 2020 and Horizon Europe as far as possible. The Commission Staff Working Document 'Best Practices in Citizen Science for Environmental Monitoring' published on 27 July 2020 is of interest in the context of this topic. This topic should involve the effective contribution of SSH disciplines.

Projects should seek to contribute to the New European Bauhaus initiative by supporting the green and digital transitions in communities' living environments through merging sustainability, inclusiveness and quality of experience. Projects, by considering the social and cultural dimensions of citizen observation of the urban environment, are well placed to contribute to the objectives of the initiative by bringing the European Green Deal into citizens' lives and living spaces.

Type of action	Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	Between EUR 3.00 and 5.00 million
Topic information	Link

HORIZON-CL6-2022-GOVERNANCE-01-10: Piloting approaches and tools to empower citizens to exercise their "data rights" in the area of food and nutrition

Expected outcome

A successful proposal will support the deployment of digital and data technologies as key enablers for the European Green Deal priorities, the EU's Climate ambition for 2030 and 2050 and the farm to fork strategy for a fair healthy and environmentally friendly food system. It will help to bring about innovative and inclusive governance, better informed decision-making processes, social engagement, and innovation. Project results are expected to contribute to all of the expected outcomes:

- empower citizens to exercise their "data rights" and to contribute to a just transition of food systems
- pilot digital solutions in food systems and nutrition with enhanced personal data protection and data sovereignty and which achieve a fairer distribution of wealth and benefits
- advance alternative approaches to food system data sharing that promote innovation and increase competition

Scope

Proposals should support the implementation of the European Data Strategy in food systems. The European Data Strategy has the ambition to make the EU the leading role model for a society empowered by data, for the benefit of all. It outlines a future in which the way that data is collected and used, places the individual first, in accordance with European values, fundamental rights and rules. It also emphasises that citizens will only trust and embrace much needed data-driven innovations – in food systems and beyond - if they are confident that any personal data sharing in the EU is compliant with strict data protection rules and respectful of their data sovereignty. Current centralised platforms for big and social data management in food systems tend to consolidate the dominance of existing incumbent actors. They allow limited control over the data by citizens (e.g. food purchasing data, data from wearables on activity and health, online behaviour regarding diet and food, data from personalised nutrition solutions), and enable lock-ins by limiting data portability.

Proposals should build on recent research and innovation about new architectures for managing online identity, personal and other data as an alternative to current dominant models. They should pilot new approaches to digital solutions in food systems and nutrition, which enhance personal data protection and data sovereignty, and which achieve a fairer distribution of wealth and benefits. The pilots should test and fine-tune new approaches that address the lack of sovereignty of European citizens on food and nutrition related data, and allow them to decide what is done with their data (purchasing data, data on dietary behaviour, nutritional health data, physical activity data). This data also includes the data that is generated by smart connected devices used by citizens. The tools and concepts of the pilots can include consent management tools, personal information management apps (including fully centralised solutions building on blockchain), as well as personal data cooperatives or trusts acting as novel neutral intermediaries in the personal data economy.

Proposals and their pilots should demonstrate the feasibility of achieving a more acceptable trade-off between the need for data-driven innovation in food and nutrition and the need for personal data protection and data sovereignty. They should be focused on 2 key areas of digital transformation and data driven innovation in food systems (such as online food retail, home delivery of food, personalised nutrition, digital tracking of food and nutrition related consumer behaviour, food advertising) whose future development is likely to have significant impact on reaching the objectives and targets of the EU's Farm-to-Fork Strategy, on meeting the EU's Climate ambition for 2030 and 2050 and on contributing to a just transition. Proposals should explain and map how the pilots will achieve co-benefits relevant

to the four Food 2030 priorities: nutrition for sustainable healthy diets, climate and environment, circularity and resource efficiency, innovation and empowerment of communities. Gender aspects should be considered, where relevant.

Proposals may provide support to third parties to develop and implement the pilots. This support to third parties can only be provided in the form of grants. As a reference, 50% of the EU funding can be allocated to financial support to the third parties, through grant amounts that are in the EUR 150 000 to 300 000 range. The amounts are deemed sufficient to pilot solutions that enough impact to be able to advance alternative approaches to food system data sharing. Proposals should focus their support for the pilots on third party projects from outstanding academic research groups, start-ups and SMEs, so that multiple third parties can be funded in parallel contributing to the same key area of digital transformation and data driven innovation, using short research cycles targeting the most promising ideas. Each of the selected third parties projects should pursue its own pilot and objectives, while the proposal should provide the programme logic and vision, the necessary technical support, as well as coaching and mentoring, in order that the collection of third party projects and pilots contributes towards a significant advancement and impact in the key area. The focus should be on advanced research that can be brought quickly to the market; apps and services that innovate without a research component are not covered by this model.

Proposals should make explicit their capacity to attract top talent, to bring about disruptive innovation in line with EU policy objectives, to engage with a broad range of with food system actors and stakeholders as well as with communities and citizens, to deliver a solid value-adding services package to the third party projects, as well as their expertise and capacity in managing the full life-cycle of the open calls transparently. They should explore synergies with other research and innovation actions, supported at regional, national or European level, to increase the overall impact. Where possible they should make data available for broader

communal use (as part of "data commons for food and nutrition") and seek integration of the data and value-added services on those data through federated infrastructure such as the European Open Science Cloud.

This topic should involve the effective contribution of SSH disciplines.

Type of action	Research and Innovation Action
Deadline	**15 February 2022**
Expected EU contribution per project	EUR 4.00 million
Topic information	Link
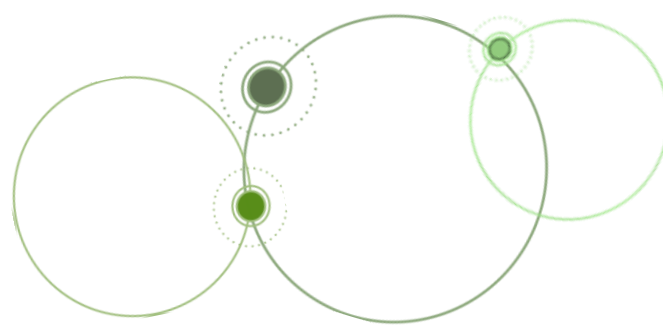
Excellent Science

Marie Skłodowska-Curie Actions

Main principles applying to the MSCA

Excellence

The MSCA focus on excellence in various aspects: excellence does not only apply to the individual fellows supported or the collaborations fostered and knowledge transferred, but also to the R&I methodologies applied, the research conducted as well as the training, supervision and career guidance provided. Long-term investment in people pays off, as indicated inter alia by the number of Nobel Prize winners who have been either former MSCA fellows or supervisors.

Mobility

Bottom-up and open to the world

The MSCA are open to all domains of research and innovation, chosen freely by the applicants in a fully bottom-up manner, addressed under the Treaty on the Functioning of the European Union. In addition, Postdoctoral Fellowships can also address domains covered by the Treaty establishing the European Atomic Energy Community (Euratom Research and Training Programme 2021-2025). All MSCA will complement top-down collaborative research activities, notably contributing to the Horizon Europe Missions.

The MSCA have also a strong international dimension: international cooperation is particularly encouraged as it allows institutions to set-up strategic collaborations worldwide, attracts foreign talents to Europe and provides European researchers with access to unique expertise, facilities, testing environments or data available only outside Europe.

Recruitment, working/employment conditions and inclusiveness

Open Science and Responsible Research and Innovation

The MSCA endorse Open Science and Responsible Research and Innovation (RRI) through engaging society at large, integrating the gender and ethical dimensions, promoting Open Science practices through targeted training activities, ensuring open access to research outcomes, including FAIR4 data handling, encouraging formal and informal science education and feeding back research results into teaching and education.

**European Green Deal**

Synergies

The MSCA promote the creation of strong links with the Cohesion policy funds and the Recovery and Resilience Facility (RRF) , notably by creating synergies through its COFUND action and enabling complementarities via awarding a Seal of Excellence certificate to proposals submitted to mono-beneficiary MSCA calls. The Seal is awarded to proposals that exceed all of the evaluation thresholds set out in this work programme, but cannot be funded due to lack of budget.

MSCA Intervention areas

There are five main MSCA intervention areas as set out in the Council Decision establishing the specific programme implementing Horizon Europe (Annex 1, page 11-13).

All individual Marie Skłodowska-Curie Actions contribute to these intervention areas to one extent or the other:

1. Nurturing Excellence through Mobility of Researchers across Borders, Sectors and Disciplines;
2. Fostering new Skills through Excellent Training of Researchers;
3. Strengthening Human Capital and Skills Development across the European Research Area;
4. Improving and Facilitating Synergies;
5. Promoting Public Outreac
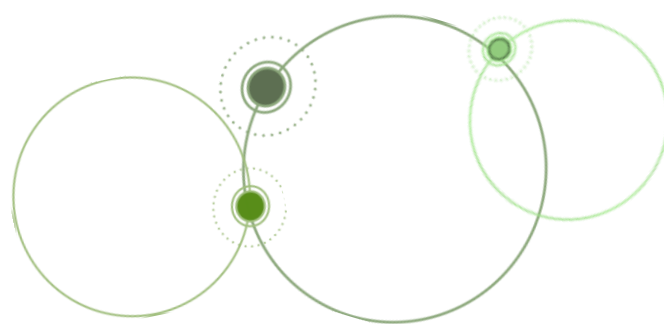
HORIZON-MSCA-2021-DN-01-01: MSCA Doctoral Networks 2021

Expected Outcome

Project results are expected to contribute to the following outcomes:

For supported doctoral candidates

- New research and transferable skills and competences, leading to improved employability and career prospects within and outside academia;
- New knowledge allowing the conversion of ideas into products and services, where relevant;
- Enhanced networking and communication capacities with scientific peers, as well as with the general public that will increase and broaden the research and innovation impact.

For participating organisations

- Improved quality, relevance and sustainability of doctoral training programmes and supervision arrangements;
- Enhanced cooperation and transfer of knowledge between sectors and disciplines;
- Increased integration of training and research activities between participating organisations;
- Boosted R&I capacity;
- Increased internationalisation and attractiveness;
- Regular feedback of research results into teaching and education at participating
- organisations.

Scope

MSCA Doctoral Networks will implement doctoral programmes, by partnerships of universities, research institutions and research infrastructures, businesses including SMEs, **and other socio-economic actors from different countries across Europe and beyond**. MSCA Doctoral Networks are indeed open to the participation of organisations from third countries, in view of fostering strategic international partnerships for the training and exchange of researchers. These doctoral programmes will respond to well-identified needs in various R&I areas, expose the researchers to the academic and non-academic sectors, and offer training in research-related, as well as transferable skills and competences relevant for innovation and long-term employability (e.g. entrepreneurship, commercialisation of results, Intellectual Property Rights, communication). Proposals for doctoral networks can reflect existing or planned research partnerships among the participating organisations. The selection procedure for doctoral candidates must be open, transparent and merit-based, in line with the Code of Conduct for the Recruitment of Researchers. The vacancy notice (to be widely advertised internationally, including on the EURAXESS website) must include the gross salary (not including employer's social contributions) offered to the researcher. MSCA Doctoral Networks are encouraged to lead to Industrial or Joint Doctorates.

Industrial Doctorates

Through Industrial Doctorates, doctoral candidates will step outside academia and develop skills in industry and business by being jointly supervised by academic and non-academic organisations, both of which can be established in the same EU Member State or Horizon Europe Associated Country.
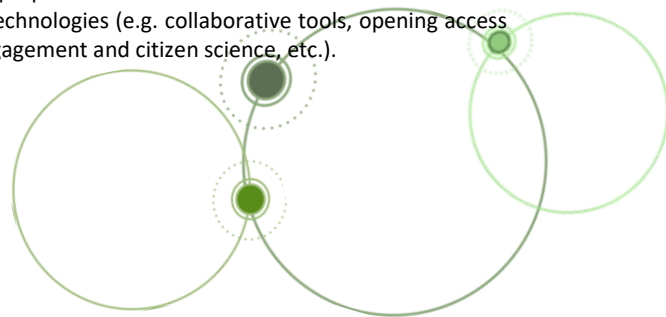
Joint Doctorates

Joint Doctorates represent a highly integrated type of international, inter-sectoral and multi/interdisciplinary collaboration in doctoral training. They lead to the delivery of joint, double or multiple doctoral degrees recognised in at least two EU Member States or Horizon Europe Associated Countries.

Steering Board

Each MSCA Doctoral Network should have a clearly identified steering board co-ordinating network-wide training and research activities and establishing continuous communication and exchange of best practice among the participating organisations to maximise the benefits of the partnership.

Training activities

MSCA Doctoral Networks should exploit complementarities between participating organisations and foster sharing of knowledge and networking activities for example through the organisation of workshops and conferences. Proposed training activities should respond to well identified needs in various R&I areas, with appropriate references to inter- and multidisciplinary fields and follow the EU Principles for Innovative Doctoral Training. They should be primarily focused on developing new scientific knowledge through original research on personalised projects. Inter-sectoral secondments of researchers to other participating organisations, including in third countries, are encouraged when relevant, feasible and beneficial for the researchers and in line with the project objectives. This will increase the employability of the researchers outside academia. Doctoral Networks should develop substantial training modules, including digital ones, addressing key transferable skills and competences common to all fields and fostering the culture of Open Science, innovation and entrepreneurship. In particular, Doctoral Networks should adequately prepare doctoral candidates for increased research collaboration and information-sharing made possible by new (digital) technologies (e.g. collaborative tools, opening access to publications and to research data, FAIR data management, public engagement and citizen science, etc.).
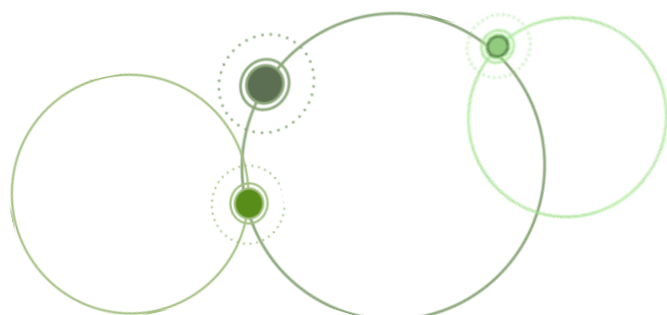
Supervision

Particular attention is paid to the quality of supervision and mentoring arrangements as well as career guidance. Joint supervision of the researchers is mandatory for Industrial and Joint Doctorates.

Career Development Plan A

Career Development Plan must be established jointly by the supervisor and each recruited doctoral candidate. In case of joint supervision, such a plan should be established involving all supervisors. In addition to research objectives, this plan comprises the researcher's training and career needs, including training on transferable skills, teaching, planning for publications and participation in conferences and events aiming at opening science and research to citizens. The plan, established at the beginning of the recruitment, should be revised (and updated where needed) within 18 months.

Type of action	TMA Doctoral Networks
Deadline	**16 November 2021**
Expected EU contribution per project	The expected EU contribution depends on the number of person-months requested.
Topic information	Link

HORIZON-MSCA-2022-DN-01-01: MSCA Doctoral Networks 2022

Expected Outcome

Project results are expected to contribute to the following outcomes:

For supported doctoral candidates

- New research and transferable skills and competences, leading to improved employability and career prospects within and outside academia;
- New knowledge allowing the conversion of ideas into products and services, where relevant;
- Enhanced networking and communication capacities with scientific peers, as well as with the general public that will increase and broaden the research and innovation impact.

For participating organisations

- Improved quality, relevance and sustainability of doctoral training programmes and supervision arrangements;
- Enhanced cooperation and transfer of knowledge between sectors and disciplines;
- Increased integration of training and research activities between participating organisations;
- Boosted R&I capacity;
- Increased internationalisation and attractiveness;
- Regular feedback of research results into teaching and education at participating organisations.

Scope

MSCA Doctoral Networks will implement doctoral programmes, by partnerships of universities, research institutions and research infrastructures, businesses including SMEs, **and other socio-economic actors from different countries across Europe and beyond**. MSCA Doctoral Networks are indeed open to the participation of organisations from third countries, in view of fostering strategic international partnerships for the training and exchange of researchers. These doctoral programmes will respond to well-identified needs in various R&I areas, expose the researchers to the academic and non-academic sectors, and offer training in research-related, as well as transferable skills and competences relevant for innovation and long-term employability (e.g. entrepreneurship, commercialisation of results, Intellectual Property Rights, communication). Proposals for doctoral networks can reflect existing or planned research partnerships among the participating organisations. The selection procedure for doctoral candidates must be open, transparent and merit-based, in line with the Code of Conduct for the Recruitment of Researchers. The vacancy notice (to be widely advertised internationally, including on the EURAXESS15 website) must include the gross salary (not including employer's social contributions) offered to the researcher. MSCA Doctoral Networks are encouraged to lead to Industrial or Joint Doctorates.

Industrial Doctorates

Through Industrial Doctorates, doctoral candidates will step outside academia and develop skills in industry and business by being jointly supervised by academic and non-academic organisations, both of which can be established in the same EU Member State or Horizon Europe Associated Country.

Joint Doctorates

Joint Doctorates represent a highly integrated type of international, inter-sectoral and multi/interdisciplinary collaboration in doctoral training. They lead to the delivery of joint, double or multiple doctoral degrees16 recognised in at least two EU Member States or Horizon Europe Associated Countries.

Steering Board

Each MSCA Doctoral Network should have a clearly identified steering board co-ordinating network-wide training and research activities and establishing continuous communication and exchange of best practice among the participating organisations to maximise the benefits of the partnership.

Training activities

MSCA Doctoral Networks should exploit complementarities between participating organisations and foster sharing of knowledge and networking activities for example through the organisation of workshops and conferences. Proposed training activities should respond to well identified needs in various R&I areas, with appropriate references to inter- and multidisciplinary fields and follow the EU Principles for Innovative Doctoral Training. They should be primarily focused on developing new scientific knowledge through original research on personalised projects. Inter-sectoral secondments of researchers to other participating organisations, including in third countries, are encouraged when relevant, feasible and beneficial for the researchers and in line with the project objectives. This will increase the employability of the researchers outside academia. Doctoral Networks should develop substantial training modules, including digital ones, addressing key transferable skills and competences common to all fields and fostering the culture of Open Science, innovation and entrepreneurship. In particular, Doctoral Networks should adequately prepare doctoral candidates for increased research collaboration and information-sharing made possible by new (digital) technologies (e.g. collaborative tools, opening access to publications and to research data, FAIR data management, public engagement and citizen science, etc.).

Supervision

Particular attention is paid to the quality of supervision and mentoring arrangements as well as career guidance. Joint supervision of the researchers is mandatory for Industrial and Joint Doctorates.

Career Development Plan

A Career Development Plan must be established jointly by the supervisor and each recruited doctoral candidate. In case of joint supervision, such a plan should be established involving all supervisors. In addition to research objectives, this plan comprises the researcher's training and career needs, including training on transferable skills, teaching, planning for publications and participation in conferences and events aiming at opening science and research to citizens. The plan, established at the beginning of the recruitment, should be revised (and updated where needed) within 18 months.

Type of action	TMA Doctoral Networks
Deadline	**16 November 2022**
Expected EU contribution per project	The expected EU contribution depends on the number of person-months requested.
Topic information	Link

Call – MSCA Postdoctoral Fellowship 2021

HORIZON-MSCA-2021-PF-01-01: MSCA Postdoctoral Fellowships 2021

Expected Outcome

Project results are expected to contribute to the following outcomes:

For supported postdoctoral fellows

- Increased set of research and transferable skills and competences, leading to improved employability and career prospects of MSCA postdoctoral fellows within academia and beyond;
- New mind-sets and approaches to R&I work forged through interdisciplinary, inter-sectoral and international experience;
- Enhanced networking and communication capacities with scientific peers, as well as with the general public that will increase and broaden the research and innovation impact. For participating organisations
- Increased alignment of working conditions for researchers in accordance with the principles set out in the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers;
- Enhanced quality and sustainability of research training and supervision;
- Increased global attractiveness, visibility and reputation of the participating organisation(s);
- Stronger R&I capacity and output among participating organisations; better transfer of knowledge;
- Regular feedback of research results into teaching and education at participating organisations.

Scope

Fellowships will be provided to excellent researchers, undertaking international mobility either to or between EU Member States or Horizon Europe Associated Countries, as well as to non-associated Third Countries. Applications will be made jointly by the researcher and a beneficiary in the academic or non-academic sector. Postdoctoral Fellowships either can take place in Europe (i.e. in an EU Member State or a Horizon Europe Associated Country) or in a Third Country not associated to Horizon Europe:

- European Postdoctoral Fellowships are open to researchers of any nationality who wish to engage in R&I projects by either coming to Europe from any country in the world or moving within Europe. The standard duration of these fellowships must be between 12 and 24 months.
- Global Postdoctoral Fellowships are open to European nationals or long-term residents who wish to engage in R&I projects with organisations outside EU Member States and Horizon Europe Associated Countries. These fellowships require an outgoing phase of minimum 12 and maximum 24 months in a non-associated Third Country, and a mandatory 12-month return phase to a host organisation based in an EU Member State or a Horizon Europe Associated Country.

Specific eligibility conditions apply to MSCA Postdoctoral Fellowships in the research areas covered by the Euratom Research and Training Programme 2021-2025 .

Secondments

Researchers receiving a Postdoctoral Fellowship may opt to include a secondment phase, within the overall duration of their fellowship in any country worldwide. The secondment phase can be a single period or be divided into shorter mobility periods. For European Postdoctoral Fellowships, secondments cannot exceed one third of the standard fellowship duration and should be in line with the project objectives, adding significant value and impact to the fellowship. For Global Postdoctoral Fellowships, optional secondments are permitted for up to one third of the outgoing phase. A maximum of three months can be spent at the start of the project at the beneficiary (or any other organisation mentioned in the description of the action), allowing the researcher to spend time there before going to the associated partner in the Third Country. Secondments cannot take place during the mandatory twelve-month return period to the host organisation in an EU Member State or Horizon Europe Associated Country.

Placements in the non-academic sector

Postdoctoral Fellowships can provide an additional period of up to six months to support researchers seeking a placement at the end of the project to work on R&I projects in an organisation from the non-academic sector established in an EU Member State or Horizon Europe Associated Country. While this possibility is also available to fellows recruited in the non-academic sector, such a placement must be implemented at a different non-academic host organisation established in an EU Member State or Horizon Europe Associated Country. The request for such a placement must be an integral part of the proposal, explaining the added-value for the project and for the career development of the researcher, and will be subject to evaluation. It must be substantiated by a letter of commitment from the European non-academic organisation where the placement takes place. This incentive aims at promoting career moves between sectors and organisations and thereby stimulate innovation and knowledge transfer while expanding career opportunities for researchers.

Training activities

The training activities implemented under the Postdoctoral Fellowships should include training for key transferable skills, foster innovation and entrepreneurship, (e.g. commercialisation of results, Intellectual Property Rights, communication, public engagement and citizen science) and promote Open Science practices (open access to publications and to research data, FAIR data management, etc.).

Career Development Plan

In order to equip MSCA postdoctoral fellows with skills that enhance and expand their career opportunities inside and outside academia, a Career Development Plan should be established jointly by the supervisor(s) and the researcher. In addition to research objectives, this plan should comprise the researcher's training and career needs, including training on transferable skills, teaching, planning for publications and participation in conferences and events aiming at opening science and research to citizens. The Plan will have to be submitted as a project deliverable at the beginning of the action and can be updated when needed.

Euratom

Aiming to enhance nuclear expertise and excellence as well as synergies between Programmes, organisations active in nuclear research established in one of EU Member States or countries associated to the Euratom Research and Training programme 2021-2025, are eligible to participate. MSCA Postdoctoral Fellowships in this area of research will be supported by the Euratom Research and Training Programme 2021-2025 through an indicative annual financial contribution of EUR 1 million to the MSCA Postdoctoral Fellowships call.

ERA Fellowships

The ERA Fellowships implemented through Work Programme Annex, Widening Participation and Strengthening the European Research Area, provide specific support to researchers to undertake their fellowship in a widening country. This will help spread excellence and contribute to fostering balanced brain circulation in widening countries.

Type of action	TMA Postdoctoral Fellowship
Deadline	**12 October 2021**
Expected EU contribution per project	The expected EU contribution depends on the number of person-months requested.
Topic information	Link
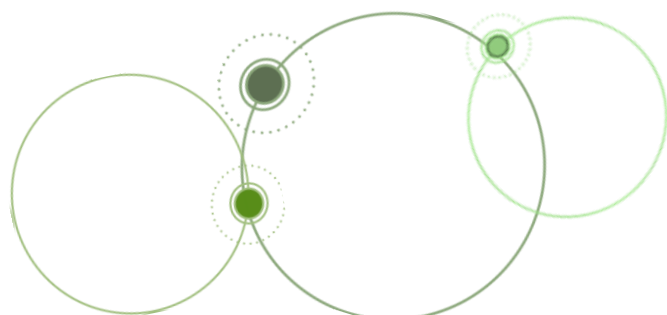
HORIZON-MSCA-2022-PF-01-01: MSCA Postdoctoral Fellowships 2022

Expected Outcome

Project results are expected to contribute to the following outcomes:

For supported postdoctoral fellows

- Increased set of research and transferable skills and competences, leading to improved employability and career prospects of MSCA postdoctoral fellows within academia and beyond;
- New mind-sets and approaches to R&I work forged through interdisciplinary, inter-sectoral and international experience;
- Enhanced networking and communication capacities with scientific peers, as well as with the general public that will increase and broaden the research and innovation impact.

For participating organisations

- Increased alignment of working conditions for researchers in accordance with the principles set out in the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers;
- Enhanced quality and sustainability of research training and supervision;
- Increased global attractiveness, visibility and reputation of the participating organisation(s);
- Stronger R&I capacity and output among participating organisations; better transfer of knowledge;
- Regular feedback of research results into teaching and education at participating organisations.

Scope

Fellowships will be provided to excellent researchers, undertaking international mobility either to or between EU Member States or Horizon Europe Associated Countries, as well as to non-associated Third Countries. Applications will be made jointly by the researcher and a beneficiary in the academic or non-academic sector. Postdoctoral Fellowships either can take place in Europe (i.e. in an EU Member State or a Horizon Europe Associated Country) or in a Third Country not associated to Horizon Europe:

- European Postdoctoral Fellowships are open to researchers of any nationality who wish to engage in R&I projects by either coming to Europe from any country in the world or moving within Europe. The standard duration of these fellowships must be between 12 and 24 months.
- Global Postdoctoral Fellowships are open to European nationals or long-term residents29 who wish to engage in R&I projects with organisations outside EU Member States and Horizon Europe Associated Countries. These fellowships require an outgoing phase of minimum 12 and maximum 24 months in a non-associated Third Country, and a mandatory 12-month return phase to a host organisation based in an EU Member State or a Horizon Europe Associated Country. Specific eligibility conditions apply to MSCA Postdoctoral Fellowships in the research areas covered by the Euratom Research and Training Programme 2021-202530 .

Secondments

Researchers receiving a Postdoctoral Fellowship may opt to include a secondment phase, within the overall duration of their fellowship in any country worldwide. The secondment phase can be a single period or be divided into shorter mobility periods. For European Postdoctoral Fellowships, secondments cannot exceed one third of the standard fellowship duration and should be in line with the project objectives, adding significant value and impact to the fellowship. For Global Postdoctoral Fellowships, optional secondments are permitted for up to one third of the outgoing phase. A maximum of three months can be spent at the start of the project at the beneficiary (or any other organisation mentioned in the description of the action), allowing the researcher to spend time there before going to the associated partner in the Third Country. Secondments cannot take place during the mandatory twelve-month return period to the host organisation in an EU Member State or Horizon Europe Associated Country.

Placements in the non-academic sector

Postdoctoral Fellowships can provide an additional period of up to six months to support researchers seeking a placement at the end of the project to work on R&I projects in an organisation from the non-academic sector established in an EU Member State or Horizon Europe Associated Country. While this possibility is also available to fellows recruited in the non-academic sector, such a placement must be implemented at a different non-academic host organisation established in an EU Member State or Horizon Europe Associated Country . The request for such a placement must be an integral part of the proposal, explaining the added-value for the project and for the career development of the researcher, and will be subject to evaluation. It must be substantiated by a letter of commitment from the European non-academic organisation where the placement takes place. This incentive aims at promoting career moves between sectors and organisations and thereby stimulate innovation and knowledge transfer while expanding career opportunities for researchers.

Training activities

The training activities implemented under the Postdoctoral Fellowships should include training for key transferable skills, foster innovation and entrepreneurship, (e.g. commercialisation of results, Intellectual Property Rights, communication, public engagement and citizen science) and promote Open Science practices (open access to publications and to research data, FAIR data management, etc.).

Career Development Plan
In order to equip MSCA postdoctoral fellows with skills that enhance and expand their career opportunities inside and outside academia, a Career Development Plan should be established jointly by the supervisor(s) and the researcher. In addition to research objectives, this plan should comprise the researcher's training and career needs, including training on transferable skills, teaching, planning for publications and participation in conferences and events aiming at opening science and research to citizens. The Plan will have to be submitted as a project deliverable at the beginning of the action and can be updated when needed.

Euratom
Aiming to enhance nuclear expertise and excellence as well as synergies between Programmes, organisations active in nuclear research established in one of EU Member States or countries associated to the Euratom Research and Training programme 2021-2025, are eligible to participate. MSCA Postdoctoral Fellowships in this area of research will be supported by the Euratom Research and Training Programme 2021-2025 through an indicative annual financial contribution of EUR 1 million to the MSCA Postdoctoral Fellowships call36 .

ERA Fellowships
The ERA Fellowships implemented through Work Programme Annex 11, Widening Participation and Strengthening the European Research Area, provide specific support to researchers to undertake their fellowship in a widening country. This will help spread excellence and contribute to fostering balanced brain circulation in widening countries.

Type of action	TMA Postdoctoral Fellowship
Deadline	**14 September 2022**
Expected EU contribution per project	The expected EU contribution depends on the number of person-months requested.
Topic information	Link
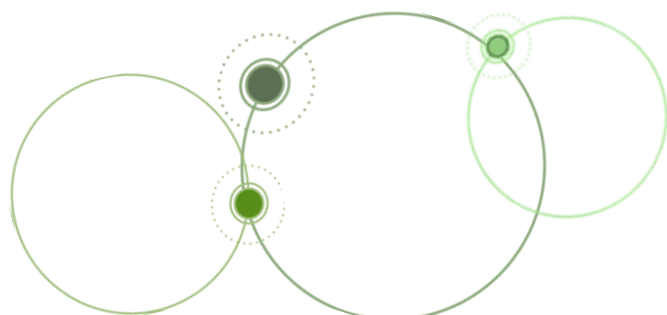
Call – MSCA Staff Exchanges 2021

HORIZON-MSCA-2021-SE-01-01: MSCA Staff Exchanges 2021

<u>Expected Outcome</u>

Project results are expected to contribute to the following outcomes:

For staff members

- Increased set of research and transferable skills and competences, leading to improved employability and career prospects within and outside academia;
- More knowledge and innovative ideas converted into products, processes and services;
- More entrepreneurial mind-sets, testing new and innovative ideas;
- Increased international exposure leading to extended networks and opportunities;
- Enhanced networking and communication capacities with scientific peers, as well as with the general public that will increase and broaden the research and innovation impact.

For participating organisations

- Innovative ways of cooperation and transfer of knowledge between sectors and disciplines;
- Strengthened and broader international, interdisciplinary and inter-sectoral collaborative networks;
- Boosted R&I capacity.

<u>Scope</u>

MSCA Staff Exchanges involve organisations from the academic and non-academic sectors (including SMEs) from across the globe. Support is provided for international, inter-sectoral and interdisciplinary mobility of R&I staff leading to knowledge transfer between participating organisations.

Mobility through secondments

The organisations constituting the partnership contribute directly to the implementation of a joint R&I project by seconding and/or hosting eligible staff members. Such a project must explore activities that can be based on previous work but should go beyond and generate or strengthen long-term collaborations. Secondments must always take place between legal entities independent from each other. MSCA Staff Exchanges can address three dimensions of mobility: inter-sectoral, international and interdisciplinary39. While exchanges between organisations within EU Member States and Horizon Europe Associated Countries should mainly be inter-sectoral, same-sector exchanges 40 are also possible under the condition that they are interdisciplinary. Interdisciplinarity is not required for same-sector exchanges with non-associated Third Countries. Secondments between institutions established in non-associated Third Countries or within the same EU Member State or Horizon Europe Associated Country are not eligible. The collaborative approach of MSCA Staff Exchanges should exploit complementary competences of the participating organisations and create synergies between them. The secondments should be essential to achieve the joint project's R&I activities. The project should inter alia enable networking activities and the organisation of workshops and conferences, to facilitate sharing of knowledge and testing of innovative approaches for specific R&I topics.

Skills' development

For participating staff members, the project should offer new skills acquisition and career development perspectives. Participating organisations must ensure that the seconded staff are adequately mentored.

Type of action	TMA Staff Exchanges
Deadline	**09 March 2022**
Expected EU contribution per project	The expected EU contribution depends on the number of person-months requested.
Topic information	Link
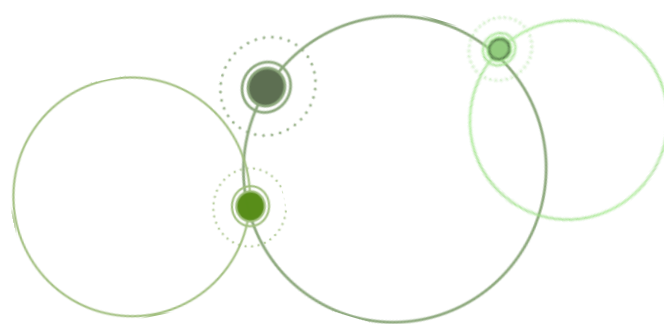
HORIZON-MSCA-2022-SE-01-01: MSCA Staff Exchanges 2022

<u>Expected Outcome</u>
Project results are expected to contribute to the following outcomes:
For staff members
- Increased set of research and transferable skills and competences, leading to improved employability and career prospects within and outside academia;
- More knowledge and innovative ideas converted into products, processes and services;
- More entrepreneurial mind-sets, testing new and innovative ideas;
- Increased international exposure leading to extended networks and opportunities;
- Enhanced networking and communication capacities with scientific peers, as well as with the general public that will increase and broaden the research and innovation impact.

For participating organisations
- Innovative ways of cooperation and transfer of knowledge between sectors and disciplines;
- Strengthened and broader international, interdisciplinary and inter-sectoral collaborative networks;
- Boosted R&I capacity.

<u>Scope</u>
MSCA Staff Exchanges involve organisations from the academic and non-academic sectors (including SMEs) from across the globe. Support is provided for international, inter-sectoral and interdisciplinary mobility of R&I staff leading to knowledge transfer between participating organisations.

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Skills' development
For participating staff members, the project should offer new skills acquisition and career development perspectives. Participating organisations must ensure that the seconded staff are adequately mentored.

Type of action	TMA Staff Exchanges
Deadline	**10 February 2022**
Expected EU contribution per project	The expected EU contribution depends on the number of person-months requested.
Topic information	Link
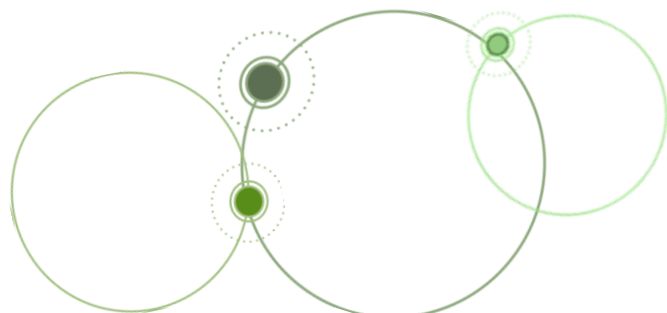
HORIZON-MSCA-2021-COFUND-01-01: MSCA COFUND 2021

<u>Exepected Outcome</u>
Projects results are expected to contribute to the following outcomes:
For supported doctoral candidates or postdoctoral researchers

- Deeper and more diverse set of research-related and transferable skills and competences;
- Improved employability and career prospects both within academia and beyond;
- New mind-sets and approaches to R&I work forged through interdisciplinary and inter-sectoral experience;
- Enhanced networking and communication capacities with scientific peers, as well as with the general public that will increase and broaden the research and innovation impact.

For participating organisations

- Enhanced quality and sustainability of research training;
- Increased global attractiveness, visibility and reputation of the participating organisation(s);
- Stronger R&I capacity and output among participating organisations;
- Increased contribution of the participating organisations to the local, regional and/or national socio-economic ecosystems;
- Regular feedback of research results into teaching and education at participating organisations.

<u>Scope</u>
Applicants submit proposals for new or existing doctoral or postdoctoral programmes with an impact on the enhancement of human resources in R&I at regional, national or international level. These programmes will be co-funded by MSCA COFUND. Proposed programmes can cover any research disciplines ("bottom-up"), but exceptionally can also focus on specific disciplines, notably when they are based on national or regional Research and Innovation Strategies for Smart Specialisation (RIS3 strategies). In this case, the range of covered disciplines should allow reasonable flexibility for the researchers to define their topic. Funding synergies with Cohesion policy funds and the Recovery and Resilience Facility (RRF) are strongly encouraged. A Career Development Plan must be jointly established by the supervisor and each recruited researcher upon recruitment. In addition to research objectives, this Plan comprises the researcher's training and career needs, including training on transferable skills, teaching, planning for publications and participation in conferences and events aimed at opening science and research to citizens. The Plan must be established at the beginning of the recruitment and should be revised (and updated where needed) within 18 months.

COFUND takes the form of:
A)Doctoral programmes
Doctoral programmes offer research training activities to allow doctoral candidates to develop and broaden their skills and competences. They will lead to the award of a doctoral degree in at least one EU Member State or Horizon Europe Associated Country. The training activities should be based on the EU Principles on Innovative Doctoral Training. Substantial training modules, including digital ones, addressing key transferable skills and competences common to all fields and fostering the culture of Open Science, innovation and entrepreneurship will be supported. They will include, inter alia, training on the use of collaborative tools, opening access to publications and to research data, FAIR data management, public engagement and citizen science. On top of compulsory international mobility, applicants are encouraged to include elements of cross-sectoral mobility and interdisciplinarity into their programmes. Collaboration with a wider set of associated partners, including from the non-academic sector, will be positively taken into account during the evaluation. These organisations may provide hosting or secondment opportunities or training modules in research or transferable skills. Particular attention is paid to the quality of supervision and mentoring arrangements as well as career guidance. The selection procedure for doctoral candidates must be open, transparent and merit-based, in line with the Code of Conduct for the Recruitment of Researchers. The vacancy notice (to be widely advertised internationally, including on the EURAXESS47 website) must include the minimum gross salary (not including employer's social contributions) offered to the researcher.

B) Postdoctoral Programmes
Postdoctoral Programmes fund individual advanced research training and career development fellowships for postdoctoral researchers. The programmes should offer training to develop key transferable skills and competences common to all fields, foster innovation and entrepreneurship and promote and (where appropriate) reward Open Science practices (open access to publications and to research data, FAIR data management, public engagement and citizen science, etc.). Postdoctoral Programmes should have regular selection rounds following fixed deadlines or regular cut-off dates, allowing fair competition between researchers. The selections should be open, widely advertised internationally (including on the EURAXESS website), competitive, merit-based and with a transparent international peer review, in line with the Code of Conduct for the Recruitment of Researchers. The vacancy notice must include the minimum gross salary (not including employer's social contributions) offered to the postdoctoral researcher. On top of compulsory international mobility, applicants are encouraged to include elements of cross-sectoral mobility and interdisciplinarity into their programmes. Researchers will be able to freely choose a research topic and the appropriate organisation to host them, fitting their individual needs.

Call – MSCA Cofund 2021

Type of action	TMA Cofund
Deadline	**10 February 2022**
Expected EU contribution per project	The expected EU contribution depends on the number of person-months requested.
Topic information	Link

HORIZON-MSCA-2022-COFUND-01-01: MSCA COFUND 2022

Expected Outcome

Projects results are expected to contribute to the following outcomes:

For supported doctoral candidates or postdoctoral researchers

- Deeper and more diverse set of research-related and transferable skills and competences;
- Improved employability and career prospects both within academia and beyond;
- New mind-sets and approaches to R&I work forged through interdisciplinary and inter-sectoral experience;
- Enhanced networking and communication capacities with scientific peers, as well as with the general public that will increase and broaden the research and innovation impact.

For participating organisations

- Enhanced quality and sustainability of research training;
- Increased global attractiveness, visibility and reputation of the participating organisation(s);
- Stronger R&I capacity and output among participating organisations;
- Increased contribution of the participating organisations to the local, regional and/or national socio-economic ecosystems;
- Regular feedback of research results into teaching and education at participating organisations.

Scope

Applicants submit proposals for new or existing doctoral or postdoctoral programmes with an impact on the enhancement of human resources in R&I at regional, national or international level. These programmes will be co-funded by MSCA COFUND. Proposed programmes can cover any research disciplines ("bottom-up"), but exceptionally can also focus on specific disciplines, notably when they are based on national or regional Research and Innovation Strategies for Smart Specialisation (RIS3 strategies). In this case, the range of covered disciplines should allow reasonable flexibility for the researchers to define their topic. Funding synergies with Cohesion policy funds and the Recovery and Resilience Facility (RRF) are strongly encouraged49,50 . A Career Development Plan must be jointly established by the supervisor and each recruited researcher upon recruitment. In addition to research objectives, this Plan comprises the researcher's training and career needs, including training on transferable skills, teaching, planning for publications and participation in conferences and events aimed at opening science and research to citizens. The Plan must be established at the beginning of the recruitment and should be revised (and updated where needed) within 18 months.

COFUND takes the form of:

A) Doctoral programmes

Doctoral programmes offer research training activities to allow doctoral candidates to develop and broaden their skills and competences. They will lead to the award of a doctoral degree in at least one EU Member State or Horizon Europe Associated Country. The training activities should be based on the EU Principles on Innovative Doctoral Training. Substantial training modules, including digital ones, addressing key transferable skills and competences common to all fields and fostering the culture of Open Science, innovation and entrepreneurship will be supported. They will include, inter alia, training on the use of collaborative tools, opening access to publications and to research data, FAIR data management, public engagement and citizen science. On top of compulsory international mobility, applicants are encouraged to include elements of cross-sectoral mobility and interdisciplinarity into their programmes. Collaboration with a wider set of associated partners, including from the non-academic sector, will be positively taken into account during the evaluation. These organisations may provide hosting or secondment opportunities or training modules in research or transferable skills. Particular attention is paid to the quality of supervision and mentoring arrangements as well as career guidance. The selection procedure for doctoral candidates must be open, transparent and merit-based, in line with the Code of Conduct for the Recruitment of Researchers. The vacancy notice (to be widely advertised internationally, including on the EURAXESS51 website) must include the minimum gross salary (not including employer's social contributions) offered to the researcher.

B) Postdoctoral Programmes

Postdoctoral Programmes fund individual advanced research training and career development fellowships for postdoctoral researchers. The programmes should offer training to develop key transferable skills and competences common to all fields, foster innovation and entrepreneurship and promote and (where appropriate) reward Open Science practices (open access to publications and to research data, FAIR data management, public engagement and citizen science, etc.). Postdoctoral Programmes should have regular selection rounds following fixed deadlines or regular cut-off dates, allowing fair competition between researchers. The selections should be open, widely advertised (including on the EURAXESS website), competitive, merit-based and with a transparent international peer review, in line with the Code of Conduct for the Recruitment of Researchers. The vacancy notice must include the minimum gross salary (not including employer's social contributions) offered to the postdoctoral researcher. On top of compulsory international mobility, applicants are encouraged to include elements of cross-sectoral mobility and interdisciplinarity into their programmes. Researchers will be able to freely choose a research topic and the appropriate organisation to host them, fitting their individual needs.
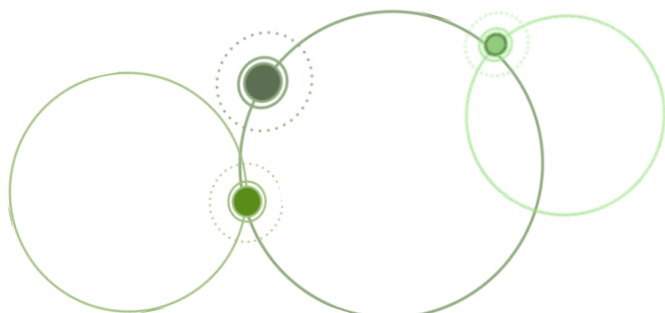
Type of action	TMA Cofund
Deadline	**09 February 2023**
Expected EU contribution per project	The expected EU contribution depends on the number of person-months requested.
Topic information	Link

Excellent Science

European Research Council

ERC – European Research Council
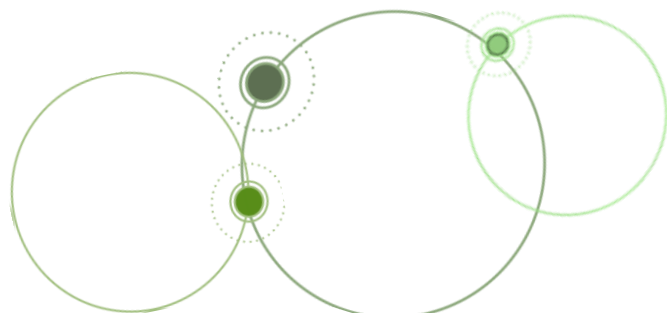
Objectives and Principles of ERC Funding

The fundamental activity of the ERC is to provide attractive, long-term funding to support excellent investigators and their research teams to pursue ground-breaking, high-gain/high-risk research. Research funded by the ERC is expected to lead to advances at the frontiers of knowledge and to set a clear and inspirational target for frontier research across Europe.

Excellence is the sole criterion on the basis of which ERC frontier research grants are awarded

Applications can be made in any field of research
The ERC's frontier research grants operate on a 'bottom-up' basis without predetermined priorities. The ERC puts particular emphasis on the frontiers of science, scholarship and engineering. In particular, it encourages proposals of a multi- or interdisciplinary nature which cross the boundaries between different fields of research, pioneering proposals addressing new and emerging fields of research or proposals introducing unconventional, innovative approaches and scientific inventions. ERC funding may also enable new ways of working in the scientific world, with the potential to create breakthrough results and facilitate commercial and social innovation potential of funded research.

Independent researchers of any age and career stage can apply for attractive long-term funding

Principal Investigators from anywhere in the world can apply for an ERC grant

The ERC frontier research grants aim to empower individual researchers and provide the best settings to foster their creativity

Summary of main features in 2022

This ERC work programme is the second under the 2021-2027 Horizon Europe Framework Programme for Research and Innovation of the European Union ('Horizon Europe').

Starting, Consolidator, Advanced and Synergy Grants will be available under this work programme. ERC Principal Investigators funded under one of these grants under prior work programmes will also be able to apply for complementary funding, via Proof of Concept Grants and the Public Engagement with Research Award.

Restrictions on applications will apply to the 2022 calls based on the outcome of the evaluation of previous calls – see restrictions on submission of proposals under "Admissibility and eligibility criteria".

Submission restrictions for Principal Investigators who served as panel members under previous calls apply.

Finally, as from 2021 it is no longer possible for applicants to opt out of the submission of Research Data Management plans.
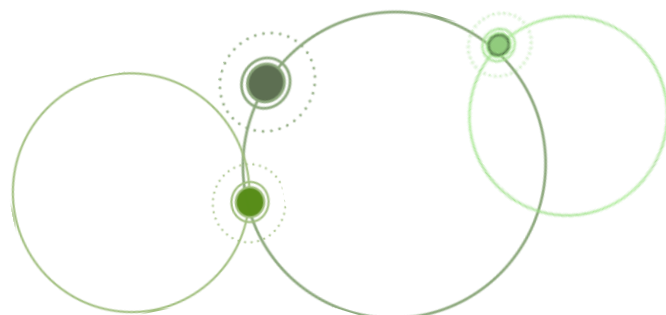
ERC – European Research Council

Indicative summary of main calls from the 2022 budget

	Starting Grant	Consolidator Grant	Advanced Grant	Synergy Grant
Call identifier	ERC-2022-StG	ERC-2022-CoG	ERC-2022-AdG	ERC-2022-SyG
Call opens	23/09/2021	19/10/2021	20/01/2022	15/07/2021
Call deadline	13/01/2022	17/03/2022	28/04/2022	10/11/2021

These dates are indicative. The Director of the European Research Council Executive Agency may open a call up to one month prior to or after the envisaged opening date. The Director may delay the envisaged call deadline by up to two months. The budget amounts for 2022 are subject to the availability of the appropriations provided for in the draft budget for 2022 after the adoption of the budget for 2022 by the budgetary authority or if the budget is not adopted as provided for in the system of provisional twelfths.

	Starting Grant	Consolidator Grant	Advanced Grant	Synergy Grant
Budget million EUR (estimated number of grants)	749 (502)	776 (388)	555 (223)	297 (33)
Planned dates to inform applicants after each step	22/07/2022 09/12/2022	02/09/2022 01/02/2023	19/12/2022 03/04/2023	12/05/2022 05/09/2022 08/11/2022
Indicative date for signature of grant agreements	08/04/2023	29/05/2023	01/08/2023	17/03/2023
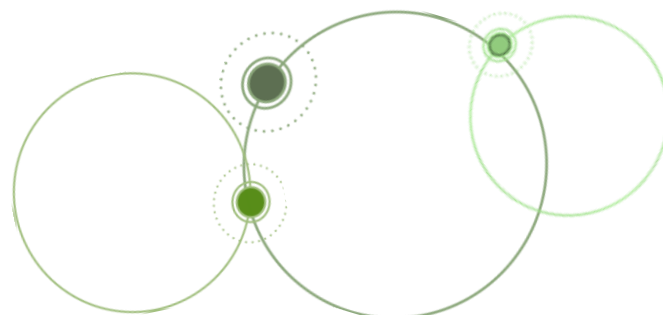
ERC – **Starting Grant**

ERC Starting Grant

Objectives
Support for excellent Principal Investigators at the career stage at which they are starting their own independent research team or programme. Principal Investigators must demonstrate the ground-breaking nature, ambition and feasibility of their research proposal.

Maximum amount and duration of the grant
Up to EUR 1 500 000 for a period of 5 years.
Additional funding up to EUR 1 000 000

Profile of the ERC Starting Grant Principal Investigator
A competitive Starting Grant Principal Investigator must have already shown the potential for research independence and evidence of maturity, for example by having produced **at least one important publication as main author or without the participation of their PhD supervisor.**
Applicant Principal Investigators should also be able to demonstrate a promising track record of early achievements appropriate to their research field and career stage, including significant publications (as main author) in major international peer-reviewed multidisciplinary scientific journals, or in the leading international peer-reviewed journals of their respective field. They may also demonstrate a record of invited presentations in well-established international conferences, granted patents, awards, prizes, etc.

Type of action	HORIZON ERC Grants
Deadline	**13 January 2022**
Call identifier	ERC-2022-StG
Topic information	Link

ERC – **Consolidator Grant**

ERC Consolidator Grant

Objective
Support for excellent Principal Investigators at the career stage at which they may still be consolidating their own independent research team or programme. Principal Investigators must demonstrate the ground-breaking nature, ambition and feasibility of their research proposal.

Maximum amount and duration of the grant
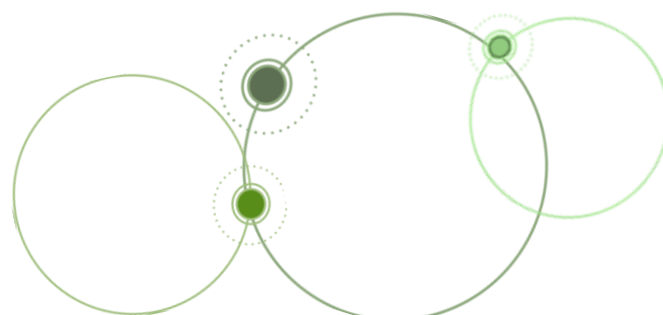Up to EUR 2 000 000 for a period of 5 years.
Additional funding up to EUR 1 000 000

Profile of the ERC Consolidator Grant Principal Investigator
A competitive Consolidator Grant Principal Investigator must have already shown research independence and evidence of maturity, for example by having **produced several important publications as main author or without the participation of their PhD supervisor**.
Applicant Principal Investigators should also be able to demonstrate a promising track record of early achievements appropriate to their research field and career stage, including significant publications (as main author) in major international peer-reviewed multidisciplinary scientific journals, or in the leading international peer-reviewed journals of their respective field. They may also demonstrate a record of invited presentations in well-established international conferences, granted patents, awards, prizes, etc.

Type of action	HORIZON ERC Grants
Deadline	**17 March 2022**
Call identifier	ERC-2022-CoG
Topic information	*The call will open on 19 October 2021*

ERC – **Advanced Grant**

ERC Advanced Grant

Objective
Support for excellent Principal Investigators at the career stage at which they are already established research leaders with a recognised track record of research achievements. Principal Investigators must demonstrate the ground-breaking nature, ambition and feasibility of their research proposal.

Maximum amount and duration of the grant
Up to EUR 2 500 000 for a period of 5 years.
Additional funding up to EUR 1 000 000.

Profile of the ERC Advanced Grant Principal Investigator
ERC Advanced Grant Principal Investigators are expected to be active researchers and to have a track record of significant research achievements in the last 10 years which must be presented in the application. A competitive Advanced Grant Principal Investigator must have already shown a record which identifies them as an exceptional leader in terms of originality and significance of their research contributions. Thus, in most fields, Principal Investigators of Advanced Grant proposals will be expected to demonstrate a record of achievements appropriate to the field and at least matching one or more of the following benchmarks:

- 10 publications as main author (or in those fields where alphabetic order of authorship is the norm, joint author) in major international peer-reviewed multidisciplinary scientific journals, and/or in the leading international peer-reviewed journals and peer-reviewed conferences proceedings of their respective field;
- 3 major research monographs. This benchmark is relevant to research fields where publication of monographs is the norm.

Other alternative benchmarks that may be considered (individually or in combination) as indicative of an exceptional record and recognition in the last 10 years:

- 5 granted patents;
- 10 invited presentations in well-established internationally organised conferences and advanced schools;
- 3 research expeditions led by the applicant Principal Investigator;
- 3 well-established international conferences or congresses where the applicant was involved as a member of the steering and/or organising committee;
- International recognition through scientific or artistic prizes/awards or membership in well-regarded Academies or artefact with documented use (for example, architectural or engineering design, methods or tools);
- Major contributions to launching the careers of outstanding researchers;
- Recognised innovation leadership.

If a Principal Investigator so chooses, their achievements over a longer period than the past ten years can be considered in the following circumstances which should be highlighted in the CV. For maternity, the track record considered can be extended by 18 months, or if longer by the amount of leave actually taken until the call deadline, for each child born before or during the last ten years.

For paternity leave, the track record considered can be extended by the amount of paternity leave actually taken until the call deadline for each child born before or during the last ten years. For long-term illness, clinical qualification or national service the track record considered can be extended by the amount of leave actually taken until the call deadline and clearly explained in the career break section of their CV for each incident which occurred during the last ten years.

Type of action	HORIZON ERC Grants
Deadline	**28 April 2022**
Call identifier	ERC-2022- AdG
Topic information	*The call will open on 20 January 2022*

ERC – **Synergy Grant**

ERC Synergy Grant

<u>Objective</u>
Support for a small group of two to four Principal Investigators to jointly address ambitious research problems that could not be addressed by the individual Principal Investigators and their teams working alone. Synergy projects should enable substantial advances at the frontiers of knowledge, stemming, for example, from the cross-fertilisation of scientific fields, from new productive lines of enquiry, or new methods and techniques, including unconventional approaches and investigations at the interface between established disciplines. The transformative research funded by Synergy Grants should have the potential of becoming a benchmark on a global scale.
Principal Investigators must demonstrate the ground-breaking nature, ambition and feasibility of their research proposal. Principal Investigators must also demonstrate that their group can successfully bring together the scientific elements necessary to address the scope and complexity of the proposed research question.

<u>Maximum amount and duration of the grant</u>
Up to EUR 10 000 000 for a period of 6 years.
Additional funding up to EUR 4 000 000

<u>Profile of the ERC Synergy Grant Group</u>
Applications must be submitted by a group of a minimum of two and a maximum of four innovative and active Principal Investigators, referred to as 'Synergy Grant Group', with competitive track records as appropriate to their career stage. Each Principal Investigator must present as part of the proposal an early achievement track-record or a 10- year track-record whichever is most appropriate for their career stage (see the profiles of the Starting, Consolidator and Advanced Grant Principal Investigators and the section "Proposal description").
Synergy Grant Groups are expected to demonstrate that they can successfully bring together those elements – such as skills, knowledge, experience, expertise, disciplines, methods, approaches, teams, access to infrastructures – necessary to address the scope and complexity of the proposed research question. Applicants are expected to describe the contribution of each PI, their team and resources to achieving the objectives proposed.
One of the Principal Investigators must be designated as the Corresponding Principal Investigator.
At any one time, one Principal Investigator per Synergy Grant Group, except the Corresponding one, may be hosted and engaged by an institution outside of the EU or Associated Countries.
The ERC expects the composition of a Synergy Grant Group to remain unchanged throughout the lifetime of the grant. If a Principal Investigator leaves a Synergy Grant Group, the grant may continue only exceptionally, subject to a scientific evaluation and provided that all eligibility criteria will continue to be met.

Type of action	HORIZON-ERC-SYG HORIZON ERC Synergy Grants
Deadline	**10 November 2021**
Call identifier	ERC-2022-SyG
Topic information	Link
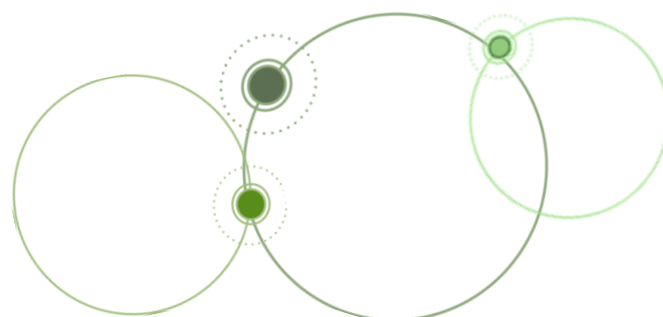
Widening participation and strengthening the European Research Area

Call – European Research Area

WF-HORIZON-WIDERA-2022-ERA-01-10: Support for policy makers – Programme level collaboration between national R&I programmes

Expected outcome

The actions funded under this topic will coordinate national and regional R&I programmes by pooling national resources and contributing to the alignment of national research and innovation policies. Projects are expected to contribute to the following expected outcomes:

- Identification of common research and innovation priorities agreed among the participating national and regional R&I programmes, taking into account international developments where relevant;
- Implementation of multiannual joint calls, resulting in the funding of transnational collaborative R&I projects;
- Implementation of other joint activities supporting the market, regulatory or societal uptake of results;
- Contribution to participating states meeting Global Challenges, including relevant contribution to the SDGs.

Scope

Since the introduction of the European Research Area (ERA) and starting with FP6, Programme level collaboration among Member States and their research and innovation programmes has become a cornerstone of the ERA, with annual investment from Member States of more than € 800 million per year. More than 250 networks among research funders have been created over time, serving different research needs but always coordinating public research investments across borders and allowing researchers to apply for calls for transnational research projects funded by the participating states.

The new policy approach to European Partnerships limits co-funding to Member State collaboration to Union and Horizon Europe priorities. Therefore, the ERA part of the Horizon Europe provides the possibility for Member States, Associated Countries and civil society organisations such as foundations, to maintain existing and establish new collaborations on priorities of their choice.

The successful proposal should align national and regional research funding programmes (managed by national or regional programme owners/managers) **on agreed common priorities** and implement joint calls for transnational R&I projects as well as other joint calls. **Proposers have to demonstrate clear commitments from participating programmes to pool resources and ensure complementarity between activities and policies with those of the Framework Programme and relevant European Partnership Initiatives.**

Applicants should pool the necessary resources from the participating national (or regional) research programmes as well as, where appropriate, leverage resources from pertinent foundations, charities and transnational initiatives, with a view to implementing calls for proposals resulting in grants to third parties without EU co-funding in this area. The proposal should also demonstrate potential impact at national, regional and transnational level research and innovation. The proposal should demonstrate that activities exclude overlaps with on-going actions co-funded by the EU under Horizon 2020 or Horizon Europe.

Participation of legal entities from third countries, and/or regions including those not automatically eligible for funding is encouraged.

The actions should envisage a duration which is appropriate to the ambition and complexity of the proposed topic.

Type of action	Coordination and Support Action
Deadline	20 April 2022
Expected EU contribution per project	Between EUR 2.00 and 3.00 million
Topic information	Link
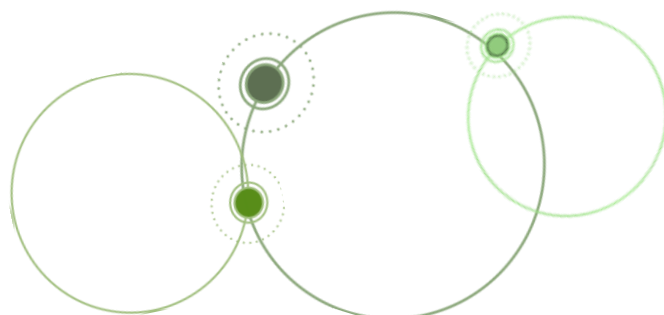
Call – European Research Area

HORIZON-WIDERA-2022-ERA-01-32: An experimentation space for the uptake and use of R&I results for EU resilience and future preparedness

Expected outcome

Projects are expected to contribute to the following expected outcomes:

- **A methodology and toolbox to design and implement testing of policy relevant findings** stemming from European R&I that can contribute to EU resilience and future preparedness.
- **A knowledge base of EU research findings, with high capacity to inform policy and engage citizens and research communities**, that are tested, including the methodologies for testing (small scale experiments, randomised control trials etc).
- **Lessons learnt to enhance the use of R&I results to enable fast response in the face of future crises and strengthen economic and social resilience, for example through supporting policy reforms, new regulation, social innovation, behavioural change, new technology adoption and the integration of the gender dimension.**

Scope:

R&I results and new scientific knowledge can inform policy making and help address societal challenges through new technological and societal solutions, as well as through providing policy recommendations and policy options with a proper (scientific) understanding of the underlying conditions. **Testing policy recommendations and findings of scientific research through experiments and novel methodologies increases understanding of the implications, risks and opportunities of possible new solutions**, enabling societies to respond faster and more effectively to crises and built resilience and social cohesion.

This action aims at increasing the visibility and fostering the use of R&I results with high policy relevance to contribute to the recovery and resilience of Europe, while engaging research communities and citizens in an "experimentation space" for new, science based, socially inclusive and gender responsive policy initiatives and solutions.

The action will match policy relevant findings for EU resilience stemming from research (such as from EU H2020, HE and previous programmes as well as other EU programmes, and national level publicly funded research) with national, regional and local needs, and carry out the experimentation phase in co-creation with the research communities and citizens. **At the core of the action is the design of appropriate trial mechanisms that will test research findings which can be translated to policy and new societal solutions,** and thereby provide policy makers and citizens with a high degree of confidence and trust in responding to new challenges.

The project consortium may consider links with related knowledge management activities by the European Commission, including the European Commission's Knowledge Centres and the Knowledge for Policy Platform hosted by the Joint Research Centre.

Type of action	Coordination and Support Action
Deadline	20 April 2022
Expected EU contribution per project	EUR 3.00 million
Topic information	Link

Call – European Research Area
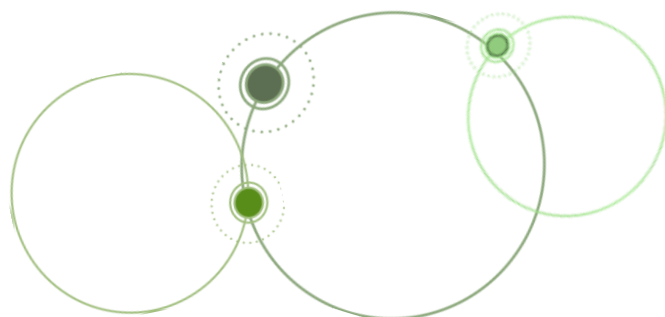
HORIZON-WIDERA-2022-ERA-01-40: Stepping-up institutional and territorial changes towards open and responsible research and innovation

<u>Expected outcome</u>

Projects are expected to contribute to the following expected outcomes:

- Consolidated evidence base on sustainable institutional and territorial changes towards open and responsible research and innovation;
- A central point of expertise providing services and support for research and innovation institutions, and territories, to open up to society;
- A significant number of institutions and territories in the European Research Area (ERA) become more porous to society, align with the needs, values and expectations of society, improve the excellence of their research and innovation, promote gender equality, and reduce instances of ethical misconduct;
- Reduction in disparities between institutions and territories in terms of their attention to open and responsible research and innovation.

These targeted outcomes in turn contribute to medium and long-term impacts:

- Open and responsible research and innovation practices mainstreamed throughout territorial and institutional settings;
- Increased impact of EU R&I outputs and the conversion of knowledge and ideas into products and services.

<u>Scope</u>

Research and innovation institutions play a key role in creating an enabling environment for opening research and innovation towards society, sharing research outputs, improving research integrity and gender equality, and promoting science education, societal engagement (such as citizen science and other forms of co-design and co-creation) and two-way science communication. At territorial level, interactions between different institutions from across the quadruple helix, and including societal actors such as civil society organisations and non-governmental organisations, are essential to ensuring that the processes and outcomes of research and innovation are aligned with the needs, values and expectations of society.

However, European research and innovation actors lack a consolidated evidence base and guidance based on EU investments in this area to date to support them, there are significant differences in attention to different aspects of responsibility and openness between institutions and territories, rewards and incentives at the workforce and institutional level are often misaligned or even disfavour openness to society, and there is no central point of reference or provider of services and expertise to turn to.

This action consists of three parts, all of which must be addressed:

The first involves consolidating the evidence base and develop innovative guidance and other materials, which can support institutions and territories to implement sustainable institutional changes and open up to society. It should take into account and build on the learning and knowledge developed by Horizon 2020's Science with and for Society programme and potentially other sources of knowledge.

The second part involves financial support to third parties, by launching 'cascading grant' call(s) to support institutions and territories from across the ERA to **implement sustainable institutional changes towards open and responsible research and innovation.** This may require consultancy or other kinds of support services to be developed and rolled out to successful institutions. A significant number of institutional changes (e.g. 70-100 individual institutional changes) should be expected in beneficiary organisations and territories. As such, a significant proportion of the funding should be allocated to the 'cascading grant' mechanism. One or more call(s) for proposals should be launched, which could focus on specific disciplines, MoRRI country clusters, or other pertinent criteria, but with the underlying goal of reducing disparities between institutions and territories in terms of their attention to different dimensions of openness and responsibility.

The third part involves acting as a central point of expertise and support services on open and responsible research and innovation for institutions and projects under Horizon Europe and within the European Research Area. This point of expertise should have appropriate high-level visibility, and the ability to interact and support all parts of the research and innovation system (all parts of quadruple helix, disciplines, sectors). In order to achieve the expected outcomes, international networking is advised to support co-operation on the issue at global level and provide expertise in support of institutions and projects. **The action should evaluate its impacts and develop recommendations useful to policy makers and those responsible for the governance of research and innovation institutions.**

The action should raise awareness of the benefits of open and responsible research and innovation to organisations across the ERA. It should develop close co-operation with other relevant projects, with a view to fostering collaboration and the early sharing of knowledge and evidence.
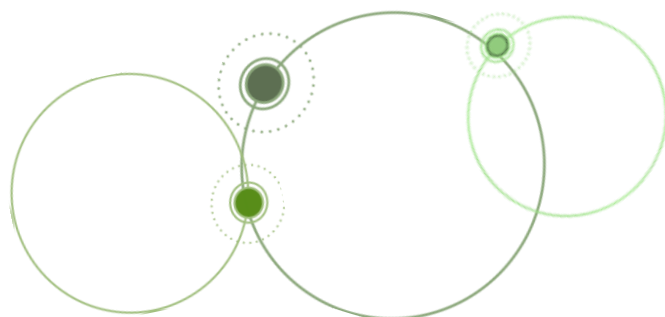
Call – European Research Area

Type of action	Coordination and Support Action
Deadline	20 April 2022
Expected EU contribution per project	EUR 5.00 million
Topic information	Link

HORIZON-WIDERA-2022-ERA-01-60: A European competence centre for science communication

Expected outcome

Projects are expected to contribute to the following expected outcomes:

- **Consolidation of knowledge and development of guidelines, tools, innovative strategies, and recommendations to improve science communication for all research and innovation actors**;
- **Establishment of a European competence centre for science communication, sustained beyond the lifetime of funding;**
- Increased networking and mutual learning, higher quality, more trustworthy, and more rapidly mobilised science communication by national authorities, businesses, civil society organisations, other stakeholders and projects.

Scope

Science communication is a scientific discipline, an activity conducted by career scientists and science outreach organisations, and a specific career pathway followed by journalists. It has the potential to improve science-society relations by increasing the transparency of science, building trust in the processes and outcomes of science, and raising scientific literacy. It can also improve the uptake of science by society and support evidence-based policy making.

Science and science communication have been undergoing radical changes over recent years, creating opportunities that may, in turn, pose new challenges. For instance, traditional media are increasingly being superseded by social media with more user-edited content; rapid diffusion of open access or pre-peer review papers gives the general public access to research that was previously locked behind paywalls; and open data enable a wider set of actors to interact with, analyse and interpret research results than in the past.

The covid-19 pandemic has highlighted the importance of communicating scientific knowledge and recommendations to respond to a fast-moving and critical threat.

It is important to learn from this and other experiences when science communication has been essential to conveying scientific knowledge and recommendations on critical issues, to explaining how hypotheses, experiments and uncertainties are also part of the scientific method, to build capacities and strengthen networks, and to ensure greater ability in the future to react rapidly and effectively to critical situations. This action has two parts, both of which must be addressed:

The first part consists of consolidating the evidence base on science communication from on-going and past projects and initiatives, covering a wide range of existing and potential critical areas for research and innovation for society. **Particular attention should be paid to contextual issues (geography, gender, age, socio-economic status, etc.) that affect the uptake or effectiveness of science communication**. Policy reports and recommendations, guidelines, and innovative strategies should be developed for all research and innovation actor types; potential targets should include government agencies and public authorities, research funding and performing organisations, and civil society organisations. **An important outcome should be the publication of one or more user-friendly handbook(s) for effective science communication, backed by an interactive and pedagogical online toolkit**, for use by Horizon Europe projects. This part should involve all parts of the quadruple helix in co-creation activities, to ensure that the outcomes are usable in different contexts, for different purposes, and by different research and innovation actors; considerable efforts to disseminate the findings across the European Research Area should be undertaken.

The second part will consist of establishing a centre of knowledge, expertise, advice, resources, and tools on science communication in the European Research Area. It should link to - and support - existing communities of knowledge and practice, with the goal of improving co-ordination and mutual learning between them. It should support potential user groups including R&I projects, public authorities, government agencies, the private sector, and civil society organisations, to improve and initiate trusted and impactful science communication. An important element will be preparing the European Research Area to react quickly to situations requiring science communication, and the ability to provide rapid advice and support, as required. The centre should work towards the sustainability of its activities beyond the lifetime of funding, including through the provision of a basket of services and other activities that have market value; a business plan should therefore be elaborated from the very earliest stages of the project.

The action should build on the knowledge, networks and capacities developed by Horizon 2020 and by national and regional initiatives and work closely with relevant projects. A minimum project duration of 4 years should be envisaged.
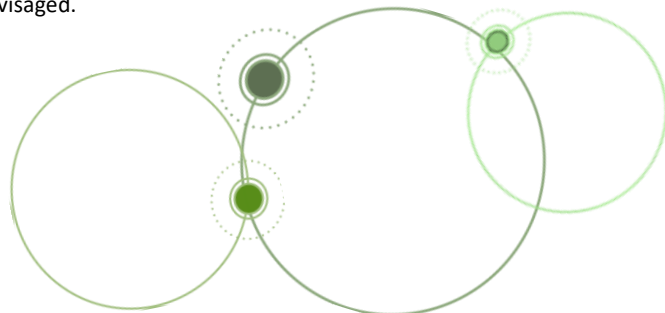
Call – European Research Area

Type of action	Coordination and Support Action
Deadline	20 April 2022
Expected EU contribution per project	EUR 3.00 million
Topic information	Link

HORIZON-WIDERA-2022-ERA-01-80: Living Lab for gender-responsive innovation

Expected outcome

Projects are expected to contribute to the following expected outcomes:

- Advancement of knowledge and practice on **gender-responsive innovation** in Europe
- Strengthening of the innovation and **inclusiveness dimensions** of the European Research Area.

Scope

Women remain disproportionately under-represented among innovators and start-up entrepreneurs and hold less than 10% of patent applications, while the integration of the gender dimension into product design, technologies and innovations in general, remains very limited despite its potential for opening new markets and its core importance for solving global challenges and European priorities. Moreover, a positive correlation between the European Innovation Scoreboard and the Gender Equality Index has been reported, and a higher proportion of research organisations with a gender equality plan in a given country is similarly correlated with a higher Innovation Score.

A **"Living Lab" will be put in place, gathering innovators as well as social science and gender scholars** to investigate and generate new and disruptive ideas to promote women innovators and develop gender-responsive innovation. This novel knowledge and collaboration scheme will build on projects and actions supported under Horizon 2020, including the EU Prize for Women Innovators and its network of awardees, project GENDERACTION, recommendations from the Horizon 2020 Expert Group to update and expand "Gendered Innovations/Innovation through Gender" and outputs of projects funded under the SwafS-26-2020 (Innovators of the future: bridging the gender gap) topic. It will also complement initiatives led by the European Innovation Council, as well as EIT-led activities aimed at supporting women-led innovation.

Proposals are expected to address the following:

- **Establish a sustainable learning and collaboration hub between various innovation ecosystem actors, including, e.g., women innovators, social innovators, education institutions, science and technology museums, foundations, start-ups and larger companies, as well as social science researchers and gender scholars from a variety of scientific disciplines.**
- **Develop real-life action research** with above-mentioned stakeholders, **based on the co-development and testing of user-centred and open and social innovation processes promoting gender equal participation**, as well as integrating the gender dimension into their contents, with an opening to intersectional approaches considering social categories intersecting with gender such as ethnicity, disability, sexual orientation or else social origin. A special focus should be placed on information technology and AI-related fields and Commission priorities such as the European Green Deal and the preparedness and response to future pandemics.
- Propose concrete new methods and solutions for the development of gender-responsive innovation in Europe.

Type of action	Research and Innovation Action
Deadline	20 April 2022
Expected EU contribution per project	EUR 3.00 million
Topic information	Link
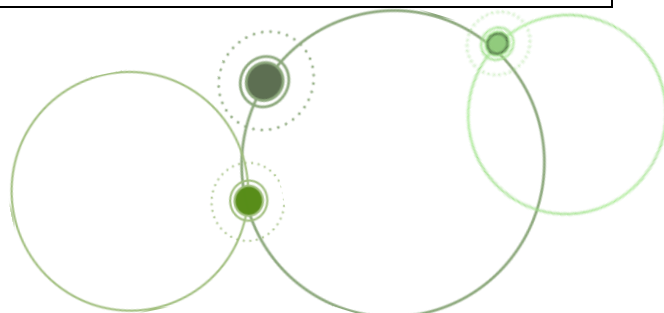
Call – European Research Area

HORIZON-WIDERA-2022-ERA-01-81: Support to the implementation of inclusive gender equality plans

Expected outcome

Projects are expected to contribute to the following expected outcomes:

- Enhance the reputation, attractiveness, inclusiveness and research excellence of less advanced institutions as a result of implementing inclusive gender equality plans.
- Transform institutions to advance inclusive gender equality within the European Research Area (ERA).

Scope

The institutional change strategy implemented through gender equality plans has had very positive impacts in many research organisations and been a catalyser at national and EU level, as the latest ERA progress report has shown. However, there is a heterogeneity in the implementation of Gender Equality Plans across the EU, and persisting structural barriers in R&I institutions which must be addressed, through a renewed approach.

The inclusion scheme aims to strengthen and go beyond the minimum requirements for a Gender Equality Plan (GEP) as defined in Horizon Europe eligibility criteria, and to support the implementation of inclusive GEPs in line with the new ERA Communication and gender equality objectives .

Actions should clearly outline the approach for boosting gender equality strategies, including new areas such as intersectionality and diversity, outreach beyond the organisation, gender budgeting, or gender and innovation among others, building on knowledge and expertise developed through related Horizon 2020 projects and tools (e.g. GEAR Tool, ACT Communities of practice). Advanced organisations will mentor on best practices, processes, monitoring and actions to undertake in the inclusive GEPs.

Proposals are expected to address the following:

- Methods for exchanging and implementing good practices and materials, tailored to individual organisations' needs for the development of inclusive GEPs;
- Support for reinforcing their networking in the area of gender equality and inclusiveness, especially with already existing Communities of Practice;
- Activities such as on-site visits, on-site or virtual training; workshops; dissemination and outreach and capacity building activities.
- Implementation of specific actions in the less advanced institutions specifically addressing the opening to intersectionality and diversity, including in the integration of intersectional sex and gender analysis into R&I content.

The partners involved in the twinning exercise are expected to revolve either around a specific thematic area or have widening partners with similar national/regional background for a better contextualization.

Type of action	Coordination and Support Action
Deadline	20 April 2022
Expected EU contribution per project	Between EUR 0.50 and 1.00 million
Topic information	Link

Call – European Research Area
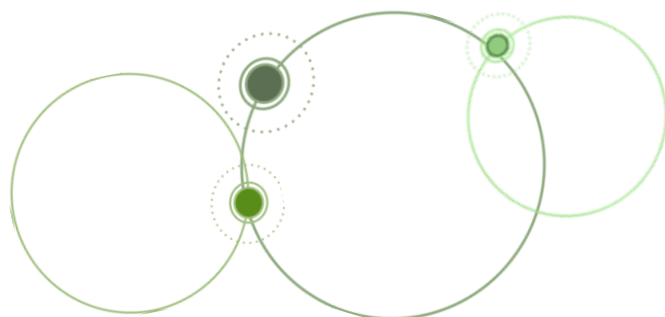
HORIZON-WIDERA-2022-ERA-01-91: The empirical and behavioural approach to research ethics and integrity

Expected outcome

Projects are expected to contribute to the following expected outcomes: Trust in science is key for an inclusive, open and democratic society. To sustain that trust, it is pivotal all research is conducted in line with the highest standards on research ethics and integrity. Research misconduct, in any stage of the research process, can undermine public trust in research and may amount to severe socio-economic consequences.

Several factors may lead researchers to breach research ethics and integrity standards and engage in questionable research practices. While some of these factors are systemic and institutional, individual factors may contribute to researchers' behaviour within the institutional environments in which they operate. While researchers mostly act with integrity, they sometimes (and often unintentionally) end up engaging in questionable practices that could lead to transgressions, engulfing research teams, departments, institutions and on rare occasions, even national research systems. **In order to develop a comprehensive preventive policy and support research organizations and research funders to uphold the highest standards of research ethics and integrity, there is a need to explore in depth the behavioural and organizational factors** that may facilitate researchers engaging in questionable practices and misconduct and develop methodologies to address those factors.

This action aims to improve the understanding of researchers' behaviours and incorporate this knowledge in measures aiming at enhancing promotion of ethics and integrity principles through shared responsibility (individual and institutional), **improved education and training processes and qualified mentoring and support**. Guaranteeing a generalised and consistently high level of research ethics and integrity, could drastically improve the relevance, robustness, accessibility and dissemination of research results and enhance societal trust in the scientific process.

Scope

In order to elucidate behavioural factors that may lead researchers to breach standards of research ethics and integrity, **this action should perform a literature review, map the existing knowledge on behavioural ethics and moral psychology and identify research outcomes and research needs.**

Based on the results of the literature review the action should develop a casuistry-based methodology to address research misconduct. This methodology should also take into account personal and institutional responsibilities for the promotion of research integrity and relevant research and efforts on the rehabilitation and reintegration of researchers. **Particular attention should be paid to issues related to the mental health and wellbeing of researchers**, especially for those employed in uncertain work conditions (short-term contracts, early career researchers, students, etc.), including with respect to bullying and sexual harassment as well as other forms of gender-based violence.

Based on the results of the literature review, the action should conduct a public consultation process with all involved stakeholders and ensuring adequate representation of young students and early career researchers. The literature review and the consultation process should also incorporate real life experiences from researchers, members of ethics and misconduct committees, Integrity and Ethics officers (and the local and national level).Participation of the private sector is strongly encouraged, especially as behavioural studies on ethical conduct in industry have been widely published and discussed.

Publicly available results from relevant EU funded research projects (e.g. SOP4RI, Integrity, PRO-Ethics, TRUST, PRO-RES, Path2Integirty) should be taken into account. Structured cooperation with the e-platform Embassy of Good Science and the European Network ENRIO, is necessary.

In order to achieve the expected outcomes, international cooperation is strongly advised, in particular with countries which have concluded an international agreement on science and technology with the European Union. Participants from countries, which are not eligible for funding according to the General Annexes, may take part in the project as associated partners

The action should develop:

i.   An identification of current needs in improving institutional research culture, taking into account the potential unequal impacts on people of different genders;

ii.   Specific course material to enhance and supplement current efforts on research ethics and integrity that stem from (but not limited to) EU-funded projects (see https://www.embassy.science/);

iii. Guidelines to facilitate adoption of the gained knowledge in host institutions - as a supplement to existing Standard Operating procedures (see SOP4RI, https://www.sops4ri.eu/). These guidelines should also cover responsible mentoring, supervision and role modelling; iv. Methodologies for measuring the short-, medium- and long-term impact of ethics and integrity trainings in the attitudes and behaviours of students and researchers and their ethical conduct in research and innovation; and v. A best practice manual, based on case studies of implemented measures that analyse what works and what does not work in various contexts, to enable practice-oriented learning.

Call – European Research Area

All outputs of the action must be available on the e-platform Embassy of Good Science web site (https://www.embassy.science/)

Type of action	Coordination and Support Action
Deadline	20 April 2022
Expected EU contribution per project	EUR 3.00 million.
Topic information	Link
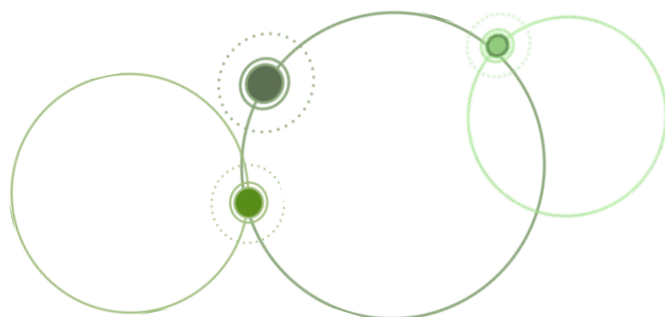
Missions

Call - Support the deployment of lighthouse demonstrators for the New European Bauhaus initiative

HORIZON-MISS-2021-NEB-01-01: Support the deployment of lighthouse demonstrators for the New European Bauhaus initiative in the context of Horizon Europe missions

Expected Outcome

Through a mutually supportive relationship, Horizon Europe missions and the New European Bauhaus (NEB) initiative will develop connections on a wide range of topics. For example, there are shared objectives in areas such as climate-neutral and smart cities, adaptation of the built environment to the effects of climate change (while respecting existing aesthetic and historical values), including flooding and sea level rise, sustainable use of soils through better spatial planning, urban greening and nature-based solutions, and cancer prevention and quality of life through healthy lifestyles and a healthy living environment. This action will offer opportunities to engage with communities on an environmentally sustainable, socially fair, and aesthetically appealing transition, using architecture, design and culture as core resources for a sustainable society. These shared qualities between Horizon Europe missions and the NEB should be capitalised on, leading to increased impact for both initiatives, and providing guidance and insight for the missions' implementation. Horizon Europe missions and the NEB both emphasise the importance of involving citizens in the green transition at the local level, in pursuit of broader societal transformation. Linking the two initiatives can help solidify the concept in the public's collective conscious that the missions embody research and innovation's capacity to positively impact their daily lives.

Proposals are expected to demonstrate all of the outcomes listed below:
- The projects should have a clear expected transformational impact both on the built environment, and on how people live and interact in that environment. The pilots will fully embrace the mission objectives and NEB principles, acting as "lighthouse demonstrators", serving as test-beds for the implementation of Horizon Europe mission objectives and innovative solutions.
- Deliver, by the end of the project, 'tangible' and replicable results, leading to benefits in the long-term.
- The grants leading to the design and deployment of the initial implementation phase are meant to catalyse substantial additional investments (e.g. partnerships of national, regional, local public and private sources, including EU Structural Funds) to ensure the implementation of the full-scale project after the design phase.
- A clear demonstration effect in relation to the operationalisation of the triangle of sustainability, inclusion and aesthetics, serving as reference for the broader implementation of the NEB initiative, as well as for the uptake and support of the Horizon Europe missions by national, regional and local authorities, other stakeholders, and European citizens, thus enabling a rapid scale-up of Horizon Europe missions' activities.

Scope

This action will contribute to the Delivery Phase of the NEB, by deploying mission-oriented pilot projects that will act as 'lighthouse demonstrators' across the territory of the European Union and Associated Countries. They should embrace the key principles of the NEB initiative (sustainability, inclusion and aesthetics), using architecture, design and culture as core resources for a sustainable society, and the mission-oriented approach (impactful, measurable, targeted) in an innovative and exemplary manner.

They should address one or more relevant challenges that represent the wide scope of the NEB initiative, such as:
- Environmental and climate adaptation challenges, environmental and climate risks, prevention and resilience
- **Economic and territorial changes linked to the green transition**
- **Social challenges (poverty, segregation, social exclusion, etc.)**
- **Challenges linked to the use, preservation and reconversion of existing infrastructure and heritage**
- **Demographic challenges (ageing, migration, depopulation, changes in property market due to tourism, etc.)**

Proposals should include:
- **The development of an ambitious, mission-oriented, quality co-design process, based on citizens' and stakeholders' participation and multidisciplinary (e.g. arts, architecture, design, heritage, engineering, physical and spatial planning, manufacturing, technology, environmental and social sciences, etc.)** and multilevel collaboration (e.g. civil society, public and private actors), also capable of addressing the relevant objectives of the Horizon Europe missions.
- **An ambitious and credible executive plan that identifies and analyses the challenges and resources of a given territory** (e.g. neighbourhood, district, ecosystem) **in terms of sustainability** (in line with the European Green Deal), **inclusiveness** (including accessibility and affordability) **and aesthetics** (including functionality, comfort, attractiveness, etc.).
- **The detailed outlined, through feasibility studies, of highly innovative, cutting-edge solutions, associating meaningful, inclusive social purpose with strong aesthetic values and sustainability, in line with the European Green Deal, to address emblematic environmental and societal challenges at the territorial level.**
- Deployment of an initial set of solutions as demonstrators within a two-year timeframe, accompanied by a rigorous impact evaluation methodology, measuring the impact of the adopted methodologies. Involvement and testing of the demonstrators with international experts.

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- **A detailed roadmap for implementation, with a sustainable financial plan quantifying and identifying substantial additional investment based on involvement and partnerships with different actors (national, regional, local, public and private sources).**
- Evidence of developed relationships and partnerships with responsible authorities and/or representatives (on planning, permits, property rights, financing, impact assessments, etc.).
- Exchange and dissemination of co-design methodology at European Union and Associated Countries level.
- Contribution to the outreach, dissemination and communication strategy and plan of the NEB and of Horizon Europe missions.
- The NEB initiative, launched in late 2020, will undergo rapid development in an open community. Potential applicants are invited to join this community under [https://europa.eu/new-european-bauhaus/index_en] to contribute to the discussion on the application of the NEB principles in the 21st, and their role in the twin green and digital transitions, and recovery from the COVID-19 crisis.
- Projects are expected to participate in European-level networking opportunities in the context of the NEB initiative.

Type of action	Coordination and Support Action
Deadline	**25 January 2022**
Expected EU contribution per project	Between EUR 3.00 and 5.00 million
Topic information	Link